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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

Edited by **Ken Turner**
University of Brighton, UK



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The early difficulties in the way of spontaneous progress are so great, that . . . a ruler full of the spirit of improvement is warranted in the use of any expedients.

John Stuart Mill, *On Liberty*

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Introduction – From a Certain Point of View (Seven Inch Version)

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... the traditional theory of meaning is wrong; and this is why the literature today contains many different concepts (e.g., 'intension' and 'notional world') and not a single unitary concept of 'meaning'. 'Meaning' has *fallen to pieces*. But we are left with the task of picking up the pieces. (Putnam, 1981, p. 29)

1. A pre-paradigmatic science

1.1. Putnam was speaking pre-paradigmatically. The pre-paradigmatic notion of 'meaning' refers to too many diverse and incompatible other notions to be of much use. It is associated, for example, with the Double Indexical Theory of Meaning¹ in which we find the following definition:

- (A) MEANING =_{def} Whatever aspect of linguistic activity happens to interest *me now*. (Lycan, 1984, p. 272)

It is necessary, of course, to understand this definition as a *reductio ad absurdum* and to acknowledge that this notion of meaning is best put to one side and discretely forgotten.

1.2. There are other positions which should be looked upon with reserve. One of these is that defended by proponents of the Use Theory of Meaning. This Theory of Meaning is associated with this definition:

- (B) MEANING =_{def} Use in a language. (Wittgenstein, 1958, §43)

The Use Theory of Meaning is difficult to characterize because it is not a theory at all: it is only interested in description. Consider Dummett's characterization:

Only particularity was acceptable; a general theory was a *fatuus ignis*, generated by the philosopher's vain hopes of finding a pattern where none existed. All that a philosopher ought to try to do was to explain the 'use' of each sentence, one by one; for that was all that could be done...

The rejection of generality, the insistence on concentrating on the 'use' of each individual sentence, led to the giving of accounts of 'use' which were often remarkably superficial, even when subtle. They were superficial, because they employed psychological and semantic concepts which a theory of meaning has no right to presuppose as already understood, since it can be expected to explain; what else, after all, could anyone do but invoke such concepts if presented with some complex sentence and asked to describe its 'use'?...

¹ If the word 'theory' here and elsewhere in what follows seems to overdignify the positions labeled then the Kripke Strategy is recommended: Replace the word 'theory' with the word 'picture'.

... particularism led to superficiality for another reason, which can be most tersely stated by saying that it promoted a conscious disregard for the distinction between semantic and pragmatic aspects. ... Anyone not in the grip of a theory, asked to explain the meaning of a sentence... would be disposed to begin by distinguishing what the sentence literally said from what, in particular circumstances, someone might seek to convey by uttering it; but, from the standpoint of the orthodox 'ordinary language' doctrine, only the latter notion was legitimate – it was what constituted the 'use' of the sentence; and, if no circumstances could be excogitated, however, bizarre, in which it might actually be uttered for some genuine purpose, then the sentence 'had no use' and was therefore meaningless. ... (Dummett, 1978, pp. 444–445)

But although this position is hard to characterize precisely, it is very easy to evaluate. The author of this Introduction stands four-square behind Dummett:

Naturally, so grotesquely false a methodology could not be consistently adhered to by intelligent people. (Dummett, 1978, p. 445)

The Use Theory of Meaning has recently been defended by Segerdahl (1996) and promptly dismissed by Turner (1998).

1.3. The No-Theory Theory of Meaning is another puzzling position:

- (C) MEANING =_{def} Something that has no hidden and substantial nature for a theory to uncover. (Schiffer, 1988, p. 59)

Arguments for the non-existence of something are, if one speaks kindly, notoriously inconclusive. If one speaks less kindly, in the present context, they are hopelessly defeatist. Also, in the present case, the position is also radically counterintuitive. One of our most certain intuitions is that speakers are able to convey meanings and audiences are able to retrieve (usually something not to dissimilar to) those meanings. The storm of Quinean qualms does not reduce the force of those intuitions.²

2. A multi-paradigmatic science

2.1. The *post*-pre-paradigmatic notion of meaning breaks down into a notion of semantics – the relation or relations between a linguistic expression and the object or objects that it refers to – and a notion of pragmatics – the relation or relations between a linguistic expression and the employer or employers of that expression.

² There are some obvious but, in the present context, necessary simplifications in this overly abbreviated account of the No-Theory. For more elaborate discussion see Higginbotham (1988) and Johnson (1988). For a full ventilation of Quinean qualms, on a wide range of matters, see anything in Hahn and Schilpp (1986), Barrett and Gibson (1990) or Leonardi and Santambrogio (1995).

This notion is associated with the (Static) Semiotic Theory of Meaning in which we find something like the following definition:

- (D) MEANING =_{def} The set-theoretic union of (i) the relation(s) between the linguistic expression and the object(s) that it refers to and (ii) the relation(s) between the linguistic expression and the employer(s) of that expression.

This notion of meaning can be derived from the speculative and programmatic remarks in Morris (1938) and the more concrete and sustained remarks in Carnap (1942). Especially important is Carnap's distinction between 'pure' semantics (and, perhaps, pragmatics – the texts remain unclear) and 'descriptive' semantics and pragmatics. The pure studies are part of logic and they are concerned with rationally reconstructed languages which are designed for specific, usually scientific, purposes: the descriptive studies are part of linguistics and they are concerned with historically attested natural languages which are available for more general purposes. It is worth quoting in full Carnap's remarks about the relative priorities of these descriptive studies:

Linguistics, in the widest sense, is that branch of science which contains all empirical investigation concerning languages. It is the descriptive, empirical part of semiotic (of spoken or written languages); hence it consists of pragmatics, descriptive semantics, and descriptive syntax. But these three parts are not on the same level; *pragmatics is the basis for all linguistics*. However, this does not mean that, within linguistics, we must always explicitly refer to the users of the language in question. Once the semantical and syntactical features of a language have been found by way of pragmatics, we may turn our attention away from the users and restrict it to those semantical and syntactical features. ... in this way, descriptive semantics and syntax are, strictly speaking, parts of pragmatics. (Carnap, 1942, p. 13)

We shall have occasion to return to the spirit of Carnap's quote in due course.

The distinction between pure and descriptive studies is important because its recognition short-circuits a broad range of criticisms that appeared in the wake of the advertisements for the Semiotic Theory of Meaning. Many of these criticisms can be found in a work like Strawson (1952). Consider the following three, taken at random:

The formal logician ... aims at an exact and highly systematic logic, comparable in these respects with mathematics. But he cannot give the exact and systematic logic of expressions of everyday speech; for these expressions have no exact and systematic logic. What he can, and does, do is to devise a set of rules which satisfies his requirements, and, at the same time, while not doing full justice to the complexities of ordinary usage, and diverging from it in many ways, does touch ordinary usage at some vital points. (Strawson, 1952, p. 57)

The logician . . . manufactures the elements of a language of his own, which, unlike ordinary language, is subject to rigid and systematically connected rules, and some of the symbols of which exhibit logical analogies to familiar expressions of ordinary speech, as these expressions are commonly, though not always, used. And in the process of system-construction he may, and does – if only by contrast – teach us a good deal about the logic of ordinary discourse. (Strawson, 1952, p. 58)

It will not do to reproach the logician for his divorce from linguistic realities, any more than it will do to reproach the abstract painter for not being a representational artist; but one may justly reproach him if he *claims* to be a representational artist. (Strawson, 1952, p. 81)

Strawson here is quite evidently having the greatest difficulty is settling upon an appropriate relationship between pure and descriptive studies.³ He seems to want to deny the validity of pure studies but he grants that such studies can teach us about the logic of ordinary discourse – which, as he, in some of his moods, admits, doesn't exist – and he concludes that it is only those logicians who *claim* to be linguists that ought to be reproached. No one had, to my knowledge, so claimed.

2.2. Until, that is, 1970. In that year Richard Montague published two audacious papers (Montague, 1970a, 1970b) in which, in the very first sentence of each, he denied that there was any “important theoretical difference between natural languages and the artificial languages of logicians” (Montague, 1970a, p. 373). He went on to say that he regarded “the construction of a theory of truth – or rather, of the more general notion of truth under an arbitrary interpretation – as the basic goal of serious syntax and semantics” (Montague, 1970b, p. 189) and he further added, with respect to the third member of the semiotic trichotomy, that it is “desirable that pragmatics should at least initially follow the lead of semantics – or its modern version, model theory – which is primarily concerned with the notions of truth and satisfaction (in a model, or under an interpretation). Pragmatics, then, should employ similar notions, though here we should speak about truth and satisfaction with respect not only to an interpretation but also to a context of use” (Montague, 1970c, p. 68).

The collapse of Carnap's distinction between pure and descriptive studies was accompanied by the design of an elaborate alternative logic to the usual first-order idioms that were current B[efore] M[ontague]. For the first time, there was a *lingua franca* adequate to the requirements and demands of the semantics community.

³ It is likely that what is behind these remarks is just a simple old-fashioned turf war. At the end of his Chapter 8, entitled *Two Kinds of Logic*, Strawson says: “What we shall not find in our results is that character of elegance and system which belongs to the constructions of formal logic. It is none the less true that the logic of ordinary speech provides a field of intellectual study unsurpassed in richness, complexity, and the power to absorb” (1952, p. 232). See also Wittgenstein's (1966, p. 2) remarks on what he regards as the main mistake made by philosophers of his generation.

This language has enabled the accumulation of a large number of precise analyses of numerous fragments of natural language (Partee, 1975; Davis and Mithun, 1979; Dowty, 1979; Stump, 1985; among many others) and signals the beginning of semantics as a mature and theoretically robust discipline. This story is now clearly, comprehensively and elegantly recounted in Partee with Hendricks (1997) and I refer the reader for further details to that account.

Possible worlds are a part of Montague's ontology. These things are postulated to ease the considerable pressures that intensional phenomena – for example, necessity – inflict upon simpler formal languages – intensions are set-theoretically defined as functions from possible worlds to extensions. They, in fact, appear in different guises, in a broad spectrum of semantic systems. They appear as *times* in temporal logics, as *speakers* in some versions of pragmatics, as *points of view* in logics of perception, as *states of belief or knowledge* in epistemic semantics or as *places* to account for such locative indexicals as 'there' and 'here'. But their introduction comes at a cost: (i) there is philosophical controversy about the precise nature of possible worlds – one striking landmark in this territory is, of course, Lewis (1986); and (ii) there is controversy about their psychological plausibility: briefly, the story is that if propositions are sets of possible worlds, then all logically equivalent propositions select the same set of all possible worlds and if we ascribe to a speaker, in a belief attribution, a belief in a proposition then we must also ascribe to that speaker belief in all the logically equivalent propositions to the initial proposition. The implausibility is obvious.

2.3. These two sets of controversy merge to provoke the following observation:

It is ironic that Montague and other logicians in the index semantics tradition have seen "necessity" and "possible worlds" as less problematic than everyday things such as properties, events, and situations; such things can be used as a basis for an approach to Montague's thesis [that there is no essential theoretical difference . . . etc. KT] which is much more in tune with the apparent ontology of natural language. (Barwise and Moravcsik, 1982, p. 214)

which in turn leads to the Relational Theory of Meaning which is driven by the next definition:

- (E) $\text{MEANING} =_{\text{def}} \text{A relation between events supported by constraints.}$
 (Barwise and Perry, 1983, p. 279; cf. van Benthem, 1986)

The Relational Theory of Meaning is unlike the (Static) Semiotic Theory in that it is not principally concerned with the construction of a theory of truth. This is a radical departure from the intellectual norm. From Frege, where the semantic value of a (declarative) sentence was argued to be a truth-value, through the thesis that the semantic value of a sentence was a function from possible worlds to truth-values and further to the thesis that the semantic value was a function from contexts of use to a function from possible worlds to truth-values, the semantic analysis of natural

language has been firmly anchored in the notion of truth. The Relational Theory of Meaning stops further (higher-order) functions being added to that tradition. This story is now clearly, comprehensively and elegantly recounted in Seligman and Moss (1997) and I refer the reader for further details to that account.

The discussion between proponents of the (Static) Semiotic Theory and those of the Relational Theory has usually focused on (i) the ontological commitment to unanalysed possible worlds versus the structured compositions of situations – the latter are defined as ordered pairs consisting of a spatio-temporal location and a situation type, where situation types are, in turn, relations between sequences of n -place relations and individuals and truth-values; and (ii) the analytic advantages of not employing global and all-encompassing worlds but rather the smaller and more flexible currency of (perhaps, in some cases, partial) situations in order to impose some structure on the space of meaning (e.g., Hintikka, 1983; Partee, 1985; Perry, 1986, 1989; Stalnaker, 1986; Cresswell, 1988, Chapter 5). But it is also possible to induce a third topic of discussion. This third topic is about (iii) the role, character and relative merits of employing indices in the (Static) Semiotic Theory versus the role, character and relative merits of employing constraints in the Relational Theory. Indices and constraints seem to be similar mechanisms. Indices anchor sentences onto contexts. Their postulation raises the question of their number, of course: certainly indices for time, place, speaker and previous discourse seem desirable (cf. Lewis, 1970). But then the following kinds of sentences

- (1) They're playing the National Anthem.
- (2) What a cold winter we had.
- (3) The gods are angry.
- (4) Just fetch your Jim another quart.

have been used to argue, in another *reductio*, for the postulation of indices for country (1), climate (2), religion (3), and previous drinks (4) (Cresswell, 1973, pp. 109–111). The undesirability of such additions is obvious.

Constraints also anchor sentences, or, more accurately, utterances, onto contexts – contexts of suites of situations. The precise story is a little difficult to reconstruct but it seems that what is intended is that (a) situations contain information about other situations; (b) this information is contained in a relation, which is taken as a primitive of the theory, called 'involvingness'; (c) this relation is regulated by a set of constraints of which (i) necessary constraints, (ii) nomic constraints, (iii) conventional constraints and (iv) conditional constraints are constraint-types and (d) speakers and hearers are somehow 'attuned' to these constraints and this attunement allows them to derive meaning from (suites of) situations. The crucial notions of 'involvingness' and 'attunement', it needs to be said, receive only intuitive and not formal content in most, if not all, versions of the Relational Theory and the question of the types of required constraints has not, as yet, yielded an adequate

or satisfactory classification. It has been observed, these lacunae notwithstanding, that the Relational Theory is a radical departure from the Semiotic Theory. This is certainly how the principal designers of this theory see the results of their efforts:

It's as if we intended to write a constitutional amendment but drifted into drafting a new constitution – or part of one, since we don't get around to discussing a number of topics, like modality, that the old system had firm rules about. (Barwise and Perry, 1985, p. 109)

But the similarities between the two are perhaps more striking than the differences. In the one, sentences are evaluated in the context of a set of worlds and the accessibility relations between those worlds: in the other, utterances are evaluated in the context of a set of situations and the involvingness relations between those situations. If there is a difference between the two it is in the standards of rigour that are employed and respected: the first is extremely rigorous; the second rather less so.

2.4. Constraints, in turn, seem to be very similar to the conversational maxims in the (Naturalistic) Semiotic Theory of Meaning. At about the same time as Montague was denying the legitimacy of the distinction between pure and descriptive studies, the contents of Paul Grice's (1967) *William James Lectures* were slowly circulating in mimeo. Some of these lectures gradually trickled into print but the full suite was not published until over twenty years later (Grice, 1989).⁴

This theory can be characterized with the following definition:

- (F) MEANING =_{def} The set-theoretic union of (i) a constellation of the speaker's beliefs and intentions and (ii) the relation(s) between the relevant linguistic expression(s), the Co-operative Principle and attendant conversational maxims and the employer(s) of that (those) expression(s). (Grice, 1989)

There is something very plausible about reducing the notion of meaning to collections of beliefs and intentions – it is certainly more in tune with ordinary intuitions than the postulation of possible worlds or constraints between situations – and there have been several recent attempts to give this reduction some bite (Schiffer, 1972; Bennett, 1976; Loar, 1981; Avramides, 1989). The results of such attempts, however, have demonstrated that the such a project (i) fails to account for linguistic creativity and (ii) nosedives into infinite regress. The project, it has been argued (Schiffer, 1987; Bar-On, 1995; Davis, 1998) is, in fact, impossible.

The other part of this theory, however, has enjoyed, and, in one form or another, continues to enjoy, spectacular success (see Rescher (1995) and Stalnaker (1998)

⁴ This slow trickle of arguments and applications has resulted in a misappreciation of some of Grice's intentions and a secondary literature that is littered with unfortunate misinterpretations of various degrees of severity. Grandy and Warner (1986), Grandy (1989) and Neale (1992) go a little way to re-coordinating some of the important issues but the full story is unlikely to be known until all of Grice's other unpublications find their way into the public domain.

for two recent endorsements of the general strategy). The roots of what has come to be called the Conversational Hypothesis can be found in the attempt to clear up some of the muddle left by Strawson (1952):

A few years after the appearance of *An Introduction to Logical Theory* I was devoting much attention to what might be loosely called the distinction between logical and pragmatic inferences. In the first instance this was prompted as part of an attempt to rebuff objections, primarily by followers of Wittgenstein, to the project of using “phenomenal” verbs, like “look” and “see”, to elucidate problems in the philosophy of perception, particularly that of explaining the problematic notion of sense-data, which seemed to me to rest on a blurring of the logical/pragmatic distinction. (That is not to say, of course, that there might not be other good reasons for rejecting the project in question.) It then occurred to me that apparatus which had rendered good service in one area might be equally successful when transferred to another; and so I canvassed the idea that the alleged divergences between Modernists’ Logic and vulgar logical connectives might be represented as being a matter not of logical but of pragmatic import. (Grice, 1989a, pp. 374–375)

Grice offers this assessment of the Hypothesis, with the benefit afforded by hindsight:

While the conversational maxims have on the whole been quite well received, the same cannot, I think, be said about my invocation of a supreme principle of conversational cooperation. One source of trouble has perhaps been that it has been felt that even in the talk-exchanges of civilized people browbeating disputation and conversational sharp practice are far too common to be offenses against the fundamental dictates of conversational practice. Another source of discomfort has perhaps been the thought that, whether its tone is agreeable or disagreeable, much of our talk-exchange is too haphazard to be directed toward any end cooperative or otherwise. Chitchat goes nowhere, unless making the time pass is a journey. (Grice, 1989a, pp. 368–369)

It is arguable, though, that precisely the opposite is the case, that the Cooperative Principle has been taken as stable *for a certain kind of discourse*, but that the maxims have been complemented with vigorous attention and revision (thus Horn, 1984; Levinson, 1987, and Martinich, 1984). These proposals have not been the object of sustained comparison. Indeed, it is not even clear what an evaluation metric for them would consist in.

2.5. In spite of all these many recent developments, the (Naturalistic) Semiotic Theory of Meaning remains underspecified at several important points. It is not specified what the relations between and relative weightings of the maxims are, nor is it specified what the relationship between the maxims and the Cooperative Principle is, nor is there yet an adequate classification of the different types of

implicature, nor is there very much in the way of extensions of the basic plan to discourse that is not 'a maximally effective exchange of information' (Grice, 1989, p. 28. But see Forrester, 1989, for some groundwork on the normative language of permission and obligation). In this context, two derivative lines of inquiry have been pursued. First, (i) of F has been dropped as the basis for a semantics and replaced, presumably on the grounds that one of Grice's applications of the Conversational Hypothesis was in defense of the material conditional as the proper semantics for *if* sentences in English, by a truth conditional account. Second, it has been observed that many, if not most (if not all), English sentences cannot be properly evaluated for truth or falsity without extensive pragmatic contributions. We come then, and with the spirit of Carnap once again much in evidence, to the (Pragmatic Intrusion) Semiotic Theory of Meaning:

- (G) MEANING =_{def} The set-theoretic union of (i) underspecified 'logical forms', (ii) pragmatic contributions and (iii) processes for putting (ii) into (i).

This theory takes sentences such as (5)–(8)

- (5) You are not going to die.
- (6) I haven't eaten.
- (7) Everybody went to Paris.
- (8) She has nothing to wear.

and observes that what they 'really mean' in the relevant contexts is conveyed by their partners (9)–(12)

- (9) You are not going to die from that grazed finger.
- (10) I haven't eaten this morning.
- (11) Everybody in our group went to Paris.
- (12) She has nothing appropriate to wear.

and it then takes up the task of explaining the derivation of (9)–(12) from their partners in (5)–(8). Bach (1994a, 1994b), for example, approaches the problem by distinguishing between minimal propositions, like those in (5)–(8), which have a truth value but evidentially not the appropriate truth value, and propositional radicals, like (13) and (14)

- (13) Steel isn't strong enough.
- (14) William almost robbed a bank.

which do not exhibit enough content for it to be possible to assign a truth value at all. He then posits two processes, ‘expansion’, for the case of minimal propositions, which enables the assignment of the appropriate truth value, and ‘completion’, for the case of propositional radicals, which provides the extra content for a truth value to be assigned. All of this remains informal: but the consequence is that the Naturalist’s dichotomy between ‘what is said’ and ‘what is implicated’ is replaced by a trichotomy of ‘what is said’ (the minimal propositions and the propositional radicals), ‘what is implicit’ (the minimal propositions plus processes of expansion and propositional radicals plus processes of completion) and ‘what is implicated’ (‘what is implicit’ plus the results of applying the Conversational Hypothesis). Similar schemes can be found in Recanati (1989, 1993) and Carston (1988, 1996, 1998).

2.6. There is one kind of sentence that has given rise to a new family of analyses. The sentence contains anaphoric pronouns outside the scope of their (indefinite) noun phrase antecedents and is illustrated in (15)–(17):

- (15) If a man owns a Mercedes Benz, he polishes it.
- (16) Every man who owns a Mercedes Benz polishes.
- (17) A man owns a Mercedes Benz. He polishes it.

These ‘Mercedes Benz’ anaphors have motivated the (Dynamic) Semiotic Theory of Meaning. This theory contains the following definition:

- (H) MEANING =_{def} Context change conditions.

The key idea in this theory is that subsequent discourse is interpreted in the context provided by the preceding discourse. That is:

Not only do the utterances we produce, orally or in writing, often depend on context for their interpretation; they also do much to determine what the context *is* ... understanding a textual passage is not only a matter of grasping its truth conditions. It is also a matter of grasping the context it provides for what comes next. (Kamp, 1985, pp. 240–242)

This idea is implemented in a very simple way. First, you introduce discourse referents for each of the indefinite noun phrases. Thus:

- (a) [*w*, *x*]

and then you introduce, in a reasonably transparent fashion, conditions on these referents: thus

- (b) [*w*, *x*]

[man (*w*), Mercedes Benz (*x*), owns (*w*, *x*)]

In the case of (15), the consequent clause requires the addition of two extra discourse referents:

- (c) $[w, x, y, z]$
 $[\text{man}(w), \text{Mercedes Benz}(x), \text{owns}(w, x)]$

and some extra conditions, giving as a result:

- (d) $[w, x, y, z]$
 $[\text{man}(w), \text{Mercedes Benz}(x), \text{owns}(w, x), \text{he}(y), \text{it}(z),$
 $\text{polishes}(y, z), w = y, x = z]$

A generalization of this procedure accounts for the anaphoric connections in (16) and (17), as well as further data (plurals and tense and aspect are given an elaborate analysis in Kamp and Reyle (1993)) and it also accounts for the illegality of sentences like (18):

- (18) *If every man owns a Mercedes Benz he polishes it.

The key feature of this kind of implementation is that interpretation involves navigation through a space of discourse representations, or information states, and this navigation is made possible by a menu of small movements whose combination either induces incremental interpretative possibilities, as in (15)–(17), or forbids them, as in (18). This story is now clearly, comprehensively and elegantly recounted in van Eijck and Kamp (1997) and in Muskens, van Benthem and Visser (1997) and I refer the reader for further details to those accounts.

The Dynamic theory comes in two principal varieties that can be individuated with a pair of binary features. On the one hand there is the Dynamic ([+ Compositional], [– Representational]) Semiotic Theory of Meaning. This position declares that (i) compositionality is the corner stone of all semantic theories in the logical tradition⁵ and that (ii) it is also one of the most central principles in natural language semantics. It further recommends that (iii) semantics is really a discipline of its own and ought not to be conflated with psychology or cognitive science. This position has been defended by, *inter alii*, Groenendijk and Stokhof (1989, 1990, 1991). On the other hand, there is the Dynamic ([– Compositional], [+ Representational]) Semiotic Theory. This position concedes that (i) compositionality may be a methodological option for analyses of small fragments of natural language syntax-semantics but it emphasises that (ii) the demands of more comprehensive accounts will decrease the attraction of such an option. It further recommends that (iii) “discourse representations can be regarded as the mental representations which speakers form in response to the verbal inputs they receive” (Kamp, 1984, p. 5) and concludes that (iv) “[n]either

⁵ The story on compositionality is now clearly, comprehensively and elegantly recounted in Janssen (1997) and ... etc. For an argument that the standard definition of compositionality is formally vacuous, see Zadrozny (1994). For a non-vacuous definition of compositionality, see Zadrozny (1997).

semantics nor cognition can be studied fruitfully on its own. Only by looking at them together can we hope to arrive, eventually, at a viable theory of either” (Kamp, 1985, p. 261). This position has been defended by, *inter alii*, Kamp (1984, 1985, 1990).

A further means of differentiating dynamic theories is provided by their perspective on the semantics-pragmatics interface. On the one hand, the compositional, non-representational theory confidently embraces the Principle of the Extension of Content into Context:

I. The Principle of the Extension of Content into Context

It is to be expected, given recent and regular technical advances, that a lot more of what is usually regarded as being pragmatics will fall within the orbit of (Dynamic ([+ Compositional], [– Representational])) model-theoretic semantics. (Cf. Groenendijk and Stokhof, 1989; among many others.)

On the other hand, the non-compositional, representational theory cautiously suggests that the Principle of the Unity of Content and Context is a reliable and empirically more adequate organizing principle:

II. The Principle of the Unity of Content and Context

There is no good reason why semantics and pragmatics should be separate one from the other. (Cf. Kamp, 1979, 1985; among several others.)

There may, of course, be additional principles that can be reconstructed from the methodological practice of other positions in the space of theoretical possibilities.

3. A dual paradigmatic science (?)

3.1. It is important to underscore that the post-pre-paradigmatic notion is *only* post-pre-paradigmatic and *not* a paradigmatic notion. The reason has been dramatically given:

Theorists working within semantics or pragmatics often seem . . . to be like two warring camps. They make raids on one another's territory trying to carry off one fact or another. Or they make a move into a piece of the other's territory raising their flag and staking it out as their own. Or the more audacious among them declare all out war and attempt to conquer the other's territory and to destroy completely the other camp. So we get such claims as this or that is really a semantic or pragmatic fact or all of semantics or all of pragmatics is reducible to or analyzable as the other. (Davis, 1987, p. 686. Saxon genitives absent in the original.)

And the situation is not made any easier if one temporarily disregards pragmatic theory⁶ and concentrates on getting the semantic theory straight:

Semantics is a veritable Balkans of the intellectual world. Localists war with holists, truth conditionalists with verificationists, deflationists with substantivists, direct-reference theorists with Fregeans, one-factor theorists with two-factor theorists, and so on. An army of enthusiasts for narrow content have occupied the territory formerly held by the proponents of wide content. Finally, no settlement of these disputes seems to be in sight. (Devitt, 1996, p. 48)

The language is dramatic but it expresses a view that is very frequently encountered in the oral traditions of the relevant academic communities. Such a view provides a suitable perspective for expressions of pessimism and defeatism and some of these expressions have not been restricted to the oral tradition (cf. Allwood, 1981; Lyons, 1987; Fant, 1990).

3.2. The purpose of this volume, and the volumes that follow in this series, is to begin to take some steps to reducing the heat of some of these discussions and to begin to increase the light that might profitably be shed on some of the problems of interdigitating content and context.

There are two points that might illuminate a forward path. First, on the Davis observation, it is prudent to heed the Hansson Advice:

The Hansson Advice

“The best way to delimitate the field of pragmatics, at least from one side, is probably to try to fix the boundary between it and its neighbour, semantics.” (Hansson, 1974, p. 163)

The prudent application of this advice ought to dispel the worries of many people in the community that pragmatics has become the indiscriminate study of ‘everything’.⁷

Second, on the Devitt observation, it is as well to recall and reinflect one of Montague’s views from a notorious footnote (Montague, 1970a, p. 374). He failed to see any great interest in syntax except as a preliminary to semantics. The same kind of strategy can be applied to discipline the disputes that Devitt notices: there is

⁶ There is much to be said for temporarily disregarding much of pragmatic theory and concentrating on more manageable game. The pragmatics literature is replete with remarks about the difficulties of pragmatic inquiry. See, for example, the first sentence of Mey (1994). One expression of almost complete despair is the following: “[P]ragmatics is an area of linguistic research with fuzzy boundaries – spreading like an uncontrollable oil slick – and ... at present no scholar will be so audacious as to claim that he knows what is pragmatic in the study of language and what is not” (Parret, Sbisà and Verschueren, 1981, pp. 7–8). Uncontrollable oil slick?

⁷ That this advice originates in a reasonably obscure collection does not excuse those who have neglected it. It also appears, in spirit, in a collection that ought to be in everybody’s personal library: “It is irrational to bite off more than you can chew whether the object of your pursuit is hamburgers or the Truth.” (Grice, 1989a, p. 369). There are no oil slicks in Brighton.

no great interest in semantics except as a preliminary to pragmatics.⁸ This strategy gives us the Hand in Hand Constraint:

The Hand in Hand Constraint

The construction of semantics and pragmatics must proceed hand in hand. (Cf. Montague, 1970b, p. 212).

The metaphor is unfortunate but it can be given a more literal bite. Research questions include (i) Is a wholistic semantics supplemented, with an additive function, by a pragmatics (as in, on some accounts, symmetrical versus temporal interpretations of conjunctions)?, or (ii) is a partial semantics reconstituted by a pragmatics (as in, on some accounts, the imposition of restrictions on quantifier domains)?, or (iii) is a (wholistic or partial) semantics restructured by a pragmatics (as in, on some accounts, the reinterpretation of evident truths or falsehoods)?⁹

The net effect of the Hansson Advice and the Hand in Hand Constraint (or something pretty much like them) *should* be to provide a rigorous methodological discipline between semantics and pragmatics to parallel that provided by, on some accounts, the Principle of Compositionality between syntax and semantics. The provision of such discipline will signal the end of pre-paradigmatic inquiry and the emergence of a properly paradigmatic science.

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⁸ The reasoning behind this claim is reconstructed as follows: If the basic aim of semantics is to characterize the notions of a true sentence (under a given, possibly dynamic, interpretation) and of entailment then this aim can be realized in many different ways, as Devitt notices, *but only some of these ways will provide a suitable basis for pragmatics* (cf. Montague, 1970a, pp. 373–374). For one recent attempt to adjudicate between the merits of direct reference and Fregean semantics as bases for pragmatics, see Lumsen (1996).

⁹ These questions are already being asked, in a fashion, by the Bach–Carston–Recanati line of enquiry. But the informal answers given to these questions leave much room for more carefully defined and explicit research.

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CHAPTER 1

Discourse Structure and the Logic of Conversation

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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Gricean maxims of conversation, Searlian speech acts and pragmatics traditionally construed examine, broadly speaking, the interactions between beliefs and intentions of participants in a dialogue and the meaning of what they say. This is very far from current dynamic semantic accounts of discourse meaning, which have exploited assignments to variables to analyze the truth conditional meaning of contextually sensitive linguistic items. Nevertheless, Grice and Searle have important insights about conversation, which formal accounts of discourse meaning need to take account of, especially in the realm of dialogue. An attractive theory of the “pragmatics/semantics interface” must integrate Grice and Searle’s contributions to pragmatics with recent developments in formal semantics.

SDRT (Asher, 1993) is an attempt to provide a theory of the interaction between pragmatics and semantics by extending a dynamic semantic account of meaning. The key idea is that discourse structure is an essential component in discourse interpretation and results from integrating pragmatic and semantic information together. Several authors have argued that information about discourse structure is needed to compute a variety of semantic effects of interpretation: temporal and pronominal anaphora (Lascarides and Asher, 1993), propositional anaphora and VP ellipsis (Asher, 1993; Van den Berg, Prubst and Scha, 1987; Asher, Hardt and Busquets, 1997), lexical ambiguity (Asher and Lascarides, 1995), the interpretation of focus (Xturruka, 1997; Asher, 1997; Roberts, 1997) and presupposition (Beaver, 1997). But much of this research has concentrated on monologue and hasn’t taken into account the sort of issues that motivated Grice and Searle in dealing with conversation.

How do Gricean concerns about communication mesh with the pragmatics/semantics interface of the sort envisioned in SDRT? Is a theory like SDRT when extended to dialogue able to account for the facts that the Gricean maxims were supposed to explain? I will argue that this is so, and that from the perspective of a dynamic semantic/pragmatic theory, we can best address Gricean concerns by investigating interactions between a level of cognitive modeling in which one agent models the goals beliefs and intentions of other participants and a level of discourse structure given by SDRT. A precise account of cognitive modeling, discourse structure construction and the interaction between these two processes replace the Gricean maxims of conversation and a Gricean theory of meaning.

1. The background: From dynamic semantics to discourse structure

To begin, let me sketch the background semantic framework that I shall presuppose. It is that of dynamic semantics (e.g., Kamp and Reyle, 1993; Groenendijk and Stokhof, 1991). These theories are designed to deal with context sensitive and anaphoric phenomena beyond the bounds of the single sentence. To this end, such theories postulate that a sentence’s meaning is a context change potential (CCP), which is a relation between contexts – “the input background” context and an

output context in which the input context has been updated with the information contained in the sentence. To define the CCP of a sentence in DRT for instance, we exploit a representational structure known as a DRS (Discourse Representation Structure), which we can just think of as first order formulas for the purposes of this paper. The background context is conceived of as a DRS (the “input” DRS), and the new sentence itself also generated under the DRS construction procedure a DRS. The update of the background context with the DRS produced the new sentence produces a new “output” DRS of the context together with the information preferred by the new sentence. Each DRS has a model theoretic interpretation, and so we can say that the CCP of a sentence is the relation between the input and output DRS or the pairs involving the model-theoretic interpretations of DRSs, which I won’t go into here (see Fernando, 1994; Muskens, 1996; Asher, 1993, 1997, for details).

We can extend this approach in dynamic semantics and integrate it with an account of discourse structure. This integration accounts for many effects of discourse structure on anaphoric phenomena. As shown in Asher (1996, 1997), one can extend the language of DRSs of standard DRT with speech act discourse referents, π_0, π_1, π_2 , etc. These speech act discourse referents act as labels of DRSs; if π is a speech act discourse referent and K a DRS, then $\pi : K$ is a labeled DRS. Discourse structure is encoded by relation symbols on speech act discourse referents; e.g., *Elaboration*(π_1, π_2) signifies that the speech act π_2 elaborates what was said in π_1 . Finally, since discourse structure is recursive, labeled DRSs can occur within other DRSs (or as subformulas of other formulas). We call such embedded, labeled structures *SDRSs*.

We can give this system of discourse representations an extensional semantics in the style of Fernando (1994) or Van Eijck and Kamp (1997) that suffices to handle some aspects of the pragmatics semantics interface and some pragmatic effects on semantic interpretation. I’ll call this approach as I have elsewhere *SDRT₀* (Asher, 1997). A more natural approach for dialogue, however, where contents rather than just eventualities are essentially involved, is to go intensional – treating the speech act discourse referents as labels of propositions or intensional contents. In this case we think of the K after the colon in $\pi : K$ as a propositional term. To give a completely unambiguous SDRS language we should write $\pi : \#K$, where $\#K$ is a term denotes the intensional content of the DRS K . I call this approach *SDRT₁* (Asher, 1997).¹ One final modification I’ll make here to study the Gricean maxims is to include within the specification of each discourse constituent a specification of the speaker of the speech act.

Each piece of new information to be added to the contextual SDRS introduces its own speech act discourse referent. But otherwise SDRT conceptions are similar in appearance to those in DRT. The representational conception of the CCP of S is a relation between SDRSs – in particular between an SDRS of SDRT represent-

¹ I argue this in more detail in Asher (1997).

ing the discourse context, a labeled SDRS derived from S , $\pi_S : \#K_S$ where K_S is the DRS produced from S using the DRS construction procedure, and an “output” SDRS.² The model theoretic conception of the CCP of an unambiguous sentence too resembles its DRT counterpart; it is a relation between model theoretic (intensional) interpretations of SDRSs.³

What changes dramatically once we move to SDRT is the complexity of computing the change wrought in the discourse context by “adding” the information contained in S . For instance, which discourse relations hold between two labels is to be determined by the notion of CCP in SDRT. For instance which discourse relations hold between labels is to be determined by the CCP of a sentence in SDRT. To compute the CCP of ϕ relative to a discourse context τ , one must compute a discourse relation between π and some available “attachment” point, which is a speech act discourse referent in the discourse context.

In effect this requires calculating a much more restricted CCP for a sentence. Instead of taking all model assignment pairs in the given context that verify the information contained in the new sentence, we must take only a restricted subset that verify in addition the appropriate attachment for the new information to the context. To calculate this more restrictive CCP notion, we have to: (1) put constraints on which speech act discourse referents may act as attachment points in the antecedently given discourse context, and (2) articulate mechanisms for constraining what are the admissible discourse relations by means of which we can bind the new information to the given discourse structure. The constraints and mechanisms needed to compute SDRT₁’s restrictive CCP notion as forming a particular logic G , a “glue” logic, for deducing a new SDRS from a contextually given SDRS and an SDRS representing new information. Because the glue logic involves defaults whose semantics in turn requires consistency tests over sets of formulas in the language, various people who have used SDRT (Asher, 1993; Lascarides and Asher, 1993; Asher, 1996; Asher and Fernando, 1997) have argued that the glue logic must have a decidable (monotonic) validity property if the task of building discourse representations is to be at all a feasible one. This then forces a distinction between a logic of *information packaging* (the glue logic) and a logic of *information content*.

Once we have constructed an SDRS, we can derive semantic consequences from it. To state the semantic consequences of the discourse attachment, SDRT requires a background theory in which the semantic consequences of discourse relations are specified. These consequences include temporal and spatio-temporal effects, effects on lexical choice and effects on the choice of binding relation and antecedent for presupposition.⁴

² This is a simplification, since discourse structure can also occur within a single sentence; but the needed refinements are irrelevant to our purpose here.

³ Once again I skip over the formal details of this intensional interpretation; see Asher (1993, 1997) for some ways of giving model theoretic interpretations to SDRSs.

⁴ For details concerning the temporal effects see (Lascarides and Asher, 1993) and concerning defi-

As an example of the consequences of discourse relations and the rhetorical function of information in context, consider the three examples from Lascarides and Asher (1993):

- (1) John entered. Fred greeted him.
- (2) John fell. Fred pushed him.
- (3) Alexis worked hard in school. She got A's in every subject.

In each one of the examples above, a different discourse relation links the labeled DRSs formed from the two component sentences. I'll label the two DRSs in each case π_1 and π_2 . In (1), the propositions expressed by the first and second sentences form a narration, and thus the SDRS for (1) will look like this as a formula:

$$\pi_1 : \text{Enter}(e_1, j) \wedge \pi_2 : \text{Greet}(e_2, f, j) \wedge \text{Narration}(\pi_1, \pi_2)$$

A consequence of $\text{Narration}(\pi_1, \pi_2)$ is that the event e_1 of John's entering must precede the event e_2 of Fred's greeting him. In (2), a different discourse relation, Explanation, holds of π_1 and π_2 . By the temporal consequences of Explanation and the fact that Fred's pushing John is an achievement and not a process or state, we know that the eventuality of John's falling must come after Fred's pushing him. Finally in (3), we have Elaboration(π_1, π_2) and we have yet another temporal relation, the relation of temporal inclusion between the main eventualities of π_1 and π_2 .

2. Traditional theories of pragmatics and semantics

Traditional theories of interpretation that combine pragmatics and semantics come in two or three versions. None of these theories are incremental and all focus on the interpretation of a single sentence (within a context). Nevertheless, these theories are important to current theories of the pragmatic semantic interface, because they force us to take account of certain pragmatic aspects of interpretation that are either altogether ignored in dynamic semantics or only implicitly addressed.

Gricean accounts take interpretation to consist in the interpreter's recovering of the author's communicative intentions, or what he wanted to say (and perhaps also why). In order to capture the aspects of meaning that go beyond that supplied

nites and presupposition, see (Asher and Lascarides, 1997). See also other cited works on SDRT in the latter paper. In (Lascarides and Asher, 1993), this background theory was made in the glue logic. But the consequences of discourse structure should be expressed as DRS or SDRS conditions, since the SDRS language is what gives the content of the discourse. So this background theory is most naturally expressed in the SDRT₀ language.

by truth conditional semantics, Griceans resort to certain conversational principles to help the interpreter reconstruct the speaker's communicative intentions. Grice's own theory appeals to a cooperative principle and maxims of conversation. The maxims of conversation are notoriously vague (e.g., the maxim of relation that says "say only what is relevant"), but they are supposed to account for certain inferences that have come to be known as *conversational implicatures*. To give an instance of how we understand Grice's proposal, consider the following sort of example.

- (4) (a) A: Is C having an affair?
 (b) B: So, how about those Giants? Made the playoffs.

Grice's maxim of relevance seems to be violated here, since B is not saying something relevant to A's concerns; B is not attempting to answer A's question at all. But this violation of the maxim generates an inference that B in fact doesn't want to answer B's question. His changing the topic is a way of conveying his refusal to discuss C's personal life. This inference is in fact crucial for understanding what B is doing with in this dialogue; it's essential also, I'll argue, for maintaining discourse coherence.

Searle's theory of speech acts is similarly intended to complement truth conditional accounts of propositional content. Speech act theory is intended to explicate the illocutionary force of an utterance, or the author's purpose behind the utterance. Sometimes this is particularly important to understand the message. For instance in Searle's famous example,

- (5) Can you pass the salt?

an analysis of the illocutionary force of this speech act yields the conclusion that it is not a question but rather a request. Understanding the illocutionary force of (5) is essential for understanding how to respond and what the author wanted to say. They will also be central for understanding how one person responds to another in a dialogue, and thus they will figure in the analysis of the rhetorical structure of a dialogue.

No Gricean or Searlian theory is formalized in a way suitable to take into account the sort of phenomena that motivate SDRT and that were mentioned in the last section.⁵ On the other hand, these theories provide a number of examples of dialogues in which the notions of implicature and indirect speech acts appear to be crucial to getting the structure and content of the discourse right. The novel perspective behind these theories is the attention to the complex interaction between the cognitive states of the participants and the interpretation of the text. In Grosz and Sidner, there is a parallelism postulated between discourse structure and intentional states, but what is interesting with Searle and Grice is the description of

⁵ The only formalization of which I am aware is Vandervekken's, which rewrites Searle's informal proposals into a formal theory in intensional logic. But it is still a sentential theory.

an inferential process from certain discourse moves to the intentional states of the speakers and hearer's and back again. Analyzing the interaction between cognitive states and discourse structure dynamically will both deepen and simplify Gricean and Searlian approaches to pragmatics.

While Grice and Searle have many valuable insights to be integrated into a theory of the pragmatics/semantics interface, I want to belie the idea that the content of a discourse derives essentially from an author's intentions and that capturing the content of the message involves reconstructing the intentions of the speaker. In such a Gricean approach, the content of a discourse amounts to its context change potential upon the interpreter's model in his KB of the speaker's KB or cognitive state – in particular, the speaker's intentions.

Consider the following Gricean example of the British commander who had captured the Indian city of Sindh and wrote to his commanding officer:

(6) Peccavi

The commanding officer was able to recover the hidden message from the words, ignoring in effect what compositional semantics for Latin would indicate (I have sinned). Is the meaning of the message what the commander intended? The use of *peccavi* in this context constitutes a code using the literal translation and an alliterative association. And thus this code usage is clearly also parasitic upon normal usage of Latin and normal translation. There is also a clear intuition that the linguistically specifiable content is not what was intended.

I want to capture the linguistically specifiable content of discourses. This is more than just what compositional semantics can give us, but it is less than the complete reconstruction of the speaker's intentions, which in many conversational settings is impossible. A speaker can misspeak relative to his intentions even if the meaning involves content derived from discourse relations. For instance, Bill might have witnessed John fall and then Mary run into him but the following report to John and Mary's parents, despite Bill's intention to report what he witnessed, will convey the information that Mary's running into John caused his fall.

(7) John fell. Mary ran into him.

Of course Bill can claim that he didn't explicitly say that Mary's running into John caused his falling, but this smacks of a legalistic defense. It's part of the linguistically competent speaker's interpretive skills to draw this inference from this discourse, and we don't have to reason in any deep way about Bill's cognitive state or have any special knowledge about his cognitive state to make this inference. The causal information has become apart of the conventional content of the discourse.

Further, requiring that the meaning of a discourse consists in the intentions of the speaker would lead to the view that whenever interpreters are not able to recover the intentions of the speaker, they miss the meaning of what is said. For instance, why exactly does my friend tell me a story about what happened to him last night?

Because he thinks I want to know? Because he finds it interesting? Because he needs to get something off his chest? It may be that I can't decide his real intention; maybe I don't even want to know. This may not stop me from understanding the story itself and assigning it a coherent discourse structure and acquiring as part of the meaning of the text the truth conditional implications of that text structure. In many cases, interpreters may not exactly be sure of the speaker's intentions and beliefs, but they are irrelevant to the content of what's said.

Let's sum up now the SDRT model of dialogue. Following Danburg-Wyld (forthcoming), we distinguish several levels of interpretation. The first has to do with compositional and lexical semantics. This may be drastically underspecified and may yield only fragmentary logical forms when the latter are understood in the usual way (Reyle, 1993; Asher and Fernando, 1997). The second level attempts to build a coherent and connected SDRS discourse structure, a complete information packaging for the content conveyed by a discourse using various pragmatic principles, as well as lexical and compositional semantics.⁶ This is the level that SDRT has concerned itself with. We postulate that each participant interprets the discourse in his or her own way constructing an SDRS that can give rise to misunderstandings (explored in Asher and Lascarides, 1998). Each represents also what is settled in his or her SDRS. The third level of interpretation involves how one discourse participant reasons about the mental states of another discourse participant given what they have said. At the SDRT level, the interpreter reconstructs the content of the message; at the third, he reconstructs why the speaker said what he did and thus the cognitive state lying behind the speech act. The third level is one of cognitive modeling.

The second and third levels of interpretation involve very different resources and inference schemes, and they're designed to do different things. SDRS's are designed to analyze and predict discourse coherence, incoherence and related semantic phenomena. Cognitive modeling is an attempt to reconstruct the speaker's mental state and discourse intentions. While SDRSs have to be constructed in order to interpret discourse, cognitive modeling is often not needed; it's a much more complex sort of reasoning than SDRS construction and more uncertain in its conclusions. Information about cognitive states is thus often extremely fragmentary and incomplete.

Nevertheless, cognitive modeling can in several cases be useful to discourse interpretation, and there are lots of interactions between the SDRS level and the cognitive modeling level that I will explore below. The first sort of interaction will show how we can exploit general constraints about cognitive models to determine discourse relations in dialogue and more importantly discourse expectations.

To do cognitive modeling, we need to make some decisions about how to think about agents' cognitive states and their relations to what they say. In earlier papers

⁶ There may be also underspecification at this level. See Asher and Fernando (1997).

on belief,⁷ both Kamp and I advocated a principle of the unity of thought and information; the same structures that are thought to be useful for characterizing information – be they sets of possible worlds, dynamic information states (sets of world assignment pairs) or more structured objects like DRSs themselves – should also be used to characterize the objects of attitudes like belief and desire. From the SDRT perspective information in discourse is conveyed by an SDRS. So by the unity of thought and information, we might conceive that attitudinal objects involve not just one DRS or some unrelated set of DRSs but rather something more like an SDRS, an interrelated structure of propositions.

The unity of thought and information thus leads us to the conclusion that the logic of the content of attitudinal states is no less complex than the logic of information content itself. But cognitive modeling is uncertain and so reasoning about agents' cognitive states will involve defaults, whose semantics in turn requires consistency tests. If cognitive modeling is to be a task that we can effectively engage in, however, then we will for the same reasons as in building SDRSs have to resort to a shallower, more superficial logic – something like the logic of information packaging. Our cognitive modeling will then take place in a quantifier free language. Our semantics for attitudes will be modal, with well-understood semantics for beliefs (assuming a K45 axiomatization with negative and positive introspection, though these won't play much of a role in what follows), a less well understood semantics for goals and a logic for intentions. Intentions will be understood as plans or sequences of action types, which themselves are formulas that determine transitions between worlds (or states). Each action type or action formula determines an alternativeness relation on the set of worlds, and action types can be combined here with a sequence operator $;$, a test operator that converts state formulas into action formulas $?$, or a non-deterministic choice operator $|$.⁸ Goals are sets of desirable outcomes. If ϕ is a goal of B then there must be some plan for reaching worlds where ϕ holds from B's doxastic alternatives. In effect testing for ϕ is the last step of that plan. Consequently, I analyze goals in terms of plans and beliefs, and in fact construe the content of the goal formula as a plan step. Atomic goal formulas simply denote the test $?\phi$, but a conjunctive formula in fact denotes a sequence $\phi; \psi$ while a disjunctive formula converts to a nondeterministic choice $-\phi | \psi$, which makes sense of certain observations about buletic contexts noted in Asher (1987).⁹ Since intentions may involve partial plans, we can think of wants just as intentions to carry out very partial plans, where only the last step of the plan may be given. So I'll just write $\text{Int}\phi$ to capture wants. To this we add one more notion needed to model defaults, the weak conditional $>$ of the glue logic discussed earlier.

⁷ See (Asher, 1987; Kamp, 1990).

⁸ For the sort of reasoning here we don't need to consider any iteration of actions.

⁹ There seems to be a deep connection between programs as intentional objects and the semantics for free choice permission verbs and for buletic attitudes, as well as to the underpinnings of dynamic semantics. But that I leave to another time.

3. Dealing with Gricean meaning I: Reconstructing speech as a form of rational behavior

The general approach taken here (and also taken in Asher and Lascarides, 1997, 1998) is that many discourse relations in dialogue come from a reconstruction of an agent's beliefs given certain intentions and observed behavior such as a particular utterance in a conversation. That is, we are trying to reconstruct the practical reasoning behind an agent's presumed rational behavior. This reconstruction at an abstract level leads us to infer the existence of certain discourse relations that typify responses in dialogue. These deductions are important because they give us a way of constraining what are the coherent responses in dialogue. Further, these relations tell us the range of expected responses to a particular speech act and so account for discourse expectations, a salient feature about dialogue.

The link with Gricean theories of meaning is that some of the Gricean maxims like quality and, indeed, the general notion of cooperativity that underlies his entire approach, are principles about the behavior of agents. Grice meant his maxims to be guides to the production and interpretation of proper conversation, but the whole notion of cooperativity is better seen as a default principle about how agents react in dialogue. That at least is how I shall take it.

Let's first look at Cooperativity, which involves an agent's goals. One agent B is cooperative with another agent A if he adopts A's goals. As part of his behavior then he will try to realize these goals and in so doing help A. This can be only a default, because there may be many times when B has conflicting goals that win out over his adopted ones. A theory of dynamics among rankings of desirable outcomes is needed to figure out whether the cooperative or noncooperative goal should be adopted. But there is also a second level to cooperativity, and that is that if the speaker does not share the conversational goals of the other participant, then he must indicate as much in his contribution.

- Cooperativity

- $((Int_A(\phi) \wedge \neg Bel_A\phi) > (Int_B(\phi) \wedge \neg Bel_B\phi)) \wedge$
 $((Int_A(\phi) \wedge \neg Bel_A\phi) \wedge \neg Int_B(\phi)) > Int_B Bel_A \neg Int_B(\phi))$

Gricean cooperativity by itself is of little good, because it doesn't tell us what an agent's goals might be in dialogue. In general it may not be possible to discern an agent's goals from what he says, but certain types of speech acts have associated conversational goals. For instance, questions have goals. A *question related goal* or QRG of a question is that the questioner wants to know the answer and doesn't; in our default language, we write this axiom as: typically if someone asks a question, they want to know the answer and don't.

- Question Related Goals

- $(A : ?\alpha \wedge QAP(\alpha, \beta)) > (\neg Know_A(\beta) \wedge Int_A(Know_A(\beta)))$

Another type of speech act with a clearly associated goal are requests. If someone makes a request then normally, he has the goal of getting the request satisfied. The formalization of this axiom would be very similar to the QRG axiom. To talk about goals of various speech acts, I'll introduce the term *speech act related goals* or SARGs. All axioms for SARGs derived from a particular type of speech act are defeasible, because, for instance, questions can be rhetorical or of the exam-type, requests might be insincere, etc.

Sincerity is an evidence axiom that I also take in spirit from Grice. Grice's maxim of quality states that one should say only that which one takes to be true. Such a maxim tells us that as a default (see (Morreau, 1995) or (Perrault, 1990)) the interpreter can take what he can compute to be the logical form of an assertive bit of discourse to be something that the agent believes. Like our axiom of cooperativity, our axiom of Sincerity becomes for us a principle of reasoning about an agent's cognitive state given what he said:

- Sincerity (Grice's Maxim of Quality)
- $\text{Say}_A(\phi) > \text{Bel}_A(\phi)$

But Grice's maxims alone aren't enough even to form the intuitive basis of a theory of rational action by speakers in a dialogue. One thing we need is an axiom of belief transfer, similar to the goal transfer of cooperativity. Davidson's notion of charity is what we need. The idea is that, as a default, one agent's beliefs are by default true. When coupled with the axiom of Sincerity, Charity implies that a speaker is normally competent concerning the subject matter of his assertions. I shall take charity as a default that interpreters' have about speakers. It is part of every interpreters' belief system.

- Charity
- $\text{Bel}_A(\phi) > \phi$

We now have axioms for inferring beliefs and desires for agents from what they or someone else might say. The way of doing this exploits what Asher and Lascarides (1997, 1998) call the *practical syllogism*:

If

1. A wants ψ and believes $\neg\psi$
 2. A believes that he can nonmonotonically infer ψ from his KB augmented with ϕ
 3. ϕ is A 's choice for achieving ψ ,
- then normally: A intends ϕ .

The way we will use the practical syllogism is often to infer beliefs of an agent from observed behavior and an additional axiom to the effect that an agent's actions are in general intentional. Suppose we observe a speech act by A ; we will infer, given an absence of evidence to the contrary, that A intended this action. According to the practical syllogism, A 's intention resulted from a particular mix

of goals and beliefs; by fixing either one, we will abduce the other. So the key to the practical syllogism is not that it is a pattern of deductive reasoning or even a nonmonotonic pattern as such. Rather it serves as an abstract model of rational behavior, which we use to abduce beliefs or goals from observed behavior.

These axioms about practical reasoning apply to reconstructing plausible speaker intentions behind certain speech acts in context. These intentions provide the content for certain discourse relations that relate the new speech act to its context in an SDRS and it is the presence of such relations that generate certain discourse expectations of possible responses.

For instance, Asher and Lascarides (1998) adopt an axiom, Indirect Question Answer Pair or IQAP, for the purposes of SDRS construction that says roughly, if A asks a question and B's affirmative statement is to be attached to it in the discourse structure, then normally B's statement is a response to the question designed to impart enough information for A to be able to compute a direct answer to his question. Formally, we write this axiom as the following, where $\langle \tau, A : ?\alpha, B : \beta \rangle$ represents the fact that B's assertoric response labeled by β is to be linked in the discourse structure τ to A's question labeled by α :

$$\langle \tau, A : ?\alpha, B : \beta \rangle > \text{IQAP}(A : \alpha, B : \beta)$$

We show in Asher and Lascarides (1998), and I now repeat, how to derive this axiom from more general principles about cognitive states. Suppose A asks a question and B replies with the assertion that ϕ . What was B doing, A (and we) might ask? I assume that the fact that a question has been asked and a response given by B is mutually believed by A and B. So now A reasons as follows. By the actions are rational axiom, A assumes that it must be B's intention to have uttered ϕ and it was his choice to carry out uttering ϕ . Further, however, a rational action should issue from a combination of beliefs, desires and the practical syllogism. By QRG, B infers that A wants to know the answer. By cooperativity B wants A to know the answer to the question. We can complete the derivation of B's intention to say ϕ , if we assume that B thinks that saying ϕ in response to the question will get A to come to know the answer. This abductive reasoning can be codified within the glue language of SDRT (see Lascarides and Asher, 1993) and issues in a conclusion that assigns B's speech act the rhetorical function of giving an indirect answer. Thus, IQAP is what B intends as the discourse relation and how B attaches his information. Given charity, A can attach B's contribution with IQAP as well, as long as the constraint is met – namely, that A can indeed derive an answer to his question from what B says.

Example of QAP:

- (8) (a) A: Is there a gas station nearby?
 (b) B: Yes.

Examples of IQAP:

- (9) (a) A: How do I get to the secret treasure?
 (b) B: It's at the head of the Secret Valley.
- (10) (a) A: How do I solve this problem?
 (b) B: If we look at the solutions in the book, we can figure it out.

There are also other responses to a question that an agent might expect. Sometimes agents can't respond because they don't have sufficient information. Typically they then respond with another question, the answer to which may be needed by the respondent before he can or will answer the first question.

- (11) (a) A: How do I solve this problem?
 (b) B: Have you been taught derivatives yet?

(11b) is some sort of prompt for more information, but what sort of discourse relation is this? I'll call it a *question-elaboration* or Q-elab, since an answer to the second question will help B provide an answer to the first question. But such prompts for information can appear not only after questions but after any speech act almost. Here's an example from the Verbmobil corpus:¹⁰

- (12) (a) A: Let's meet in two weeks.
 (b) B: OK, are you free then on the seventeenth?

The basic Q-elaboration axiom is as simple as the axiom for IQAP:

- Q-Elaboration
- $\langle \tau, A : \alpha, B : ?\beta \rangle > \text{Q-Elab}(A : \alpha, B : \beta)$

The content of the Q-elab question specifies a connection between the answer to the elaborating question and the SARG of the speech act to which the question is attached. The idea is that a direct answer to the Q-elab question should pair down the executable plans – i.e., the plans that can be executed in the actual world – under consideration for achieving the relevant SARG. Q-elabs are in effect an attempt to build a possible plan for realizing a SARG by using the information in the answer to the question. The idea is that the paired down set of plans should all make true at some point the answer to the question, and further it should not be possible to “splice out” the bits of those plans that make the answer true and still get a plan that is executable and leads to the goal. Plans are sequences of action types and so while the preconditions and post-conditions of each action must be compatible with the facts of the actual world and at least one of its possible futures (we assume a future branching model of time here – see Koons and Asher (1994),

¹⁰ Verbmobil is a large computational linguistics project involving the University of Stuttgart and several other German universities and industrial firms.

for example), they may be executable in a variety of worlds, and each action type in the plan denotes a transition between states or sets of worlds.

To carry out this idea more precisely, I'll assume as part of this module a dynamic logic that includes the weak nonmonotonic conditional $>$ of Asher and Morreau (1991). I'll assume as in Koons and Asher (1994) that there is an operator, *Done* from plans to propositions that tells us whether a plan has been accomplished. In the language of dynamic logic we write the fact that the realization of the plan establishes (typically) the SARG as: $[p]T > \text{Done } \phi$, where p is the plan and ϕ is the SARG. Most importantly, I'll assume that plans can depend on information in an essential way. That is, a plan to achieve some goal may be derived from a particular bit of information, together with the relevant background assumptions that the agent asking the Q-elab in the discourse context τ believes prior to getting an answer to his question, but is not derivable without this information from what the two agents in the dialogue mutually believe. We have to parameterize the beliefs of the agents to the initial discourse context because the beliefs of the agents evolve as a dialogue proceeds. The asymmetry for the belief conditions will hopefully become clear below. I'll write $(\phi, \psi, \text{KB}_{\tau,A,B}) \gg p$ to indicate that the plan p to achieve goal ϕ depends essentially in the way I have said on the information that ψ and what B believes and what A and B mutually believe given the initial discourse context. In the dynamic logic we have specified, this will hold just in case the following formula is valid, where τ is the relevant discourse context and $\text{KB}_{\tau,A,B}$ is A's and B's mutual beliefs given τ and ϕ is the relevant goal:

- Definition of $(\phi, \psi, \text{KB}_{\tau,A,B}) \gg p$
- $(\phi, \psi, \text{KB}_{\tau,A,B}) \gg p$ iff $((\text{KB}_{\tau,B} \wedge \psi) > ([p]T > \text{Done}(\phi))) \wedge \neg(\text{KB}_{\tau,A,B} > ([p]T > \text{Done}(\phi)))$.

Now for the constraint on Q-elab:

- Constraint on Q-elab
- $(\langle \tau, A:\alpha, B:\beta \rangle \wedge \text{Q-elab}(A:\alpha, B:\beta) \wedge \text{SARG}(\alpha, \phi) \wedge \text{IQAP}(\beta, \gamma)) \rightarrow \exists q((\phi, \gamma, \text{KB}_{\tau,A,B}) \gg q \wedge \text{Executable}(q) \wedge \neg[\phi]T > \text{Done}(q))$.

In words the constraint on Q-elab says that if Q-elab holds of α and β and ϕ is the SARG underlying α , then an answer to the question in β should specify, given what A and B mutually believe and what the discourse context affords, a plan to bring about ϕ that is more detailed than ϕ itself.

To see how the Q-elab constraint works, consider the following dialogue (13) from the Verbmobil corpus (a project on dialogue at Stuttgart and Stanford).

- (13) (a) A: Let's meet in two weeks.
 (b) B: OK, are you free then on the seventeenth?
 (c) A: No, I don't have any time then.

(13a,b) are an instance of Q-elaboration. The constraint on Q-elab is met because the answer in (13c) helps to specify a plan to reach A's SARG "by elimination". This can be easily seen model theoretically: the set of pairs of states (initial and end states of the plan) that are the semantic value of a plan that exploits the answer is a distinct subset of the set of state pairs that are the value of the general plan of meeting in two weeks. Presumably B can now derive a plan from A's answer. Further, the plan to meet some other time than the 17th could not be derived from what A and B believed given the discourse context τ . So both parts of the consequent of the constraint are satisfied. Since the right hand side of the Q-elab constraint is satisfied in this case, it is consistent to assume Q-elab in this situation since the constraint is satisfied and so we infer Q-elab by default. Consider the following extension to (13):

- (14) (a) A: Let's meet in two weeks.
 (b) B: OK, are you free then on the seventeenth?
 (c) A: Yes, I am. How about in the morning?

A's Q-elab in (14c) further specifies the plan to achieve his original SARG that was already somewhat specified in (14b). My analysis of this observation is as follows. B's *OK* in (14b) establishes that B takes A's SARG on board. (Even if he hadn't said *OK*, it would have been implied by the Q-elab.) The interesting turn occurs with (14c), which again is a Q-elab (on (14b)). A's response in (14c) has an anaphoric or underspecified element; he doesn't say the morning of which day he means explicitly. But by the Q-elab constraint, A's reply must specify a more detailed plan of B's SARG, which we could take to be the plan of meeting on the 17th, implied by his Q-elab in (14b). Thus, we predict A's question to be about the morning of the seventeenth, which is what is intuitively meant by inferring Q-elab, which we do in virtue of attaching A's question to B's question.

To make the desired prediction, we need an axiom implying by default that if B makes a Q-elab then he is committing himself to taking on board as a SARG a plan that satisfies the Q-elab constraint. Define: $\text{Plan}(\alpha, \beta, \gamma, X)$ iff X is a plan that is defined by the Q-elab constraint on $\text{Q-elab}(\alpha, \beta)$ with $\text{IQAP}(\beta, \gamma)$. Then here's the relevant axiom:

- $(\text{Q-elab}(A : \alpha, B : \beta) \wedge \text{IQAP}(\beta, \gamma) \wedge \text{Plan}(\beta, \gamma, X)) > \text{SARG}_B(\beta, X)$

Let's look at (14) again in view of this axiom. (14c.1) (the first sentence of the third turn) establishes a set of plans that B is committed to meeting on the 17th. With (14c.2) and the second Q-elab, A commits himself, given our new axiom, to a refinement of that SARG by making another Q-elab.

How do we get the Q-Elab axiom and its constraints? Once again we can assume by Cooperativity that B shares the SARG ϕ he calculates for A's speech act. What we and A observe is that B asks a question, which again we conclude is intentional behavior. Using the practical syllogism we can infer as before that A believed

that asking the question would lead him to get to A's goal. The Q-elab question of course has a QRG: B wants to know the answer and doesn't. Now how does this goal of B's fit in with his other goal ϕ ? B thinks that by getting the answer to his question, he can help achieve ϕ . Since ϕ is some goal, deriving this goal from B's beliefs will involve some plan for achieving ϕ ; satisfying the QRG may also involve a plan – a subplan of ϕ . Hence B thinks that the direct answer to B's question will specify a plan that will lead to the fulfillment of A's SARG. By Charity, we conclude by default that the direct answer to B's question does help specify a plan. This is what the constraint on Q-elab specifies.

The Q-Elab axiom doesn't fire when one can't find an answer to the question that is related to the person's goals. Consider the following example.

- (15) (a) A: Let's meet in two weeks.
 (b) B: OK. What is the name of the president of the EC?

the response to B's question doesn't (unless very special circumstances are assumed) allow us to build a plan that specifies the general plan of meeting in two weeks. The Q-Elab axiom should fire in this case, but there is an incoherence between (15a) and the question (15b). B has accepted the goal but then asks a question whose answer does not apparently specify a plan for achieving that goal. So if A is trying to attach B's question to his proposal, he can't compute on the basis of what he believes that B is elaborating a plan to achieve the SARG of his own utterance. So the Q-elab constraint can't hold. As the Q-elab constraint fails to hold and this blocks the Q-elab axiom from firing, A will find B's question incoherent, unless some other relation can be computed. But I think there aren't any such relations unless B is simply changing topic and so is making a break in the discourse. By using incoherent examples in this way, we can also restrict the number of axioms within the theory.

This is not to say that (15b) *couldn't* be a Q-elab. B might have some special beliefs that allow him to compute a plan for achieving A's SARG. But in order for A to be able to compute the discourse relation Q elab (or we), we would have to know what that information is. (15) should be distinguished from a third situation in which the other participant in the dialogue may simply not take the SARG on board. He may do so for a variety of reasons. He may drop the present intention given by cooperativity from the SARG if he doesn't see any way of achieving that intention (Singh, 1994; Koons and Asher, 1994, both adopt such a principle). Or he may not adopt it because of prior, conflicting goals. But on our definition of cooperativity if you don't adopt the goals of your partner you should indicate this somehow – either by a different question or by explicitly saying so.

When people refuse to answer questions, then they are dropping or refusing to take on the questioner's SARG. They often do so implicitly, however, by giving an explanation for why they aren't taking that goal on. In (16), for example, the author is explaining why he can't answer the question, and why he doesn't have the goal to get A to know the answer to his question.

- (16) (a) A: How do I solve this problem?
 (b) B: Sorry, I don't know. [You have to solve it yourself.]

Following Polanyi, I will call B's response (16b) a "metatalk" rhetorical move. B's response has a metatalk relation to A's question, because it explains why he can't give an answer to A's question, why he can't make a particular speech act or rhetorical move. Of course, Explanation is also a discourse relation and a rhetorical function, but a non-metatalk explanation is a proposition that explains why a certain fact described by another proposition obtains. Metatalk explanations explain why certain speech acts occurred or didn't occur.

A metatalk axiom is triggered in cooperative dialogue whenever the SARG of the previous turn is not shared by the respondent. The metatalk relation should hold of A's response to the question just in case one can compute from the response that the SARG is not shared. Notice that even with such metatalk axioms, the example (15) will still be incoherent, because first of all B has accepted A's SARG explicitly with "OK" and secondly, asking an unrelated question is not a way of indicating the lack of shared SARG's.

Metatalk relations are often used to make clear a speaker's SARG for some other speech act. Sometimes speakers want to make explicit SARG's not covered by the defaults so as to make their SARG's more compelling. They do so by metatalk relations as in (19) above or as in (17) (below), which features a metatalk Result* relation between (17a) and (17b) and between the two clauses in (17d).

- (17) (a) A: Je suis tombé en panne. Est-ce que tu peux m'aider?
 (b) B: Où es tu?
 (c) A: Je suis devant le refuge qui se trouve à environ un km après Couiza. Il y a là une cabine téléphonique.
 (d) B: Il y a plusieurs refuges aux alentours de Couiza. Dans quelle direction es tu parti de Couiza?

Metatalk relations typically exploit relations of result or explanation between some feature of the speaker and the speech act that he has just made or is about to make (hence the * on the Result* and Explanation* to differentiate them from "object level" results and explanations). The Result* relation in the first exchange is obvious; in (17d) B is first correcting a presupposition of A's in his conversational turn (which itself has the structure of an Elaboration). But this Correction also in turn serves to motivate why he then asks his next question in the context of this dialogue which is about finding out where A is.

Requests or commands seem to generate the same sort of possible responses as do questions. One expects and perhaps discourse coherence demands either an acknowledgement that the request will be carried out, a refusal (perhaps accompanied by an explanation of why the request cannot be carried out) or a prompt for more information.

- (18) (a) A: Please go get some bread.
 (b) B: Ok [No, I can't right now] [Do you have any money?]

Of course, once we assign to requests SARG's – and it's pretty clear what these SARG's should be (carry out the request), then it's straightforward to see how to generate the axioms that would yield the appropriate connections. We would have axioms for Accept or Reject-request and we would also exploit Q-elab. We can also have metatalk relations like Result* and Explanation* with requests too:

- (19) I'm cold. Could you please close the window?

In (19) the speaker is trying to explain why he is making his request with his first assertion.

Assertions themselves can be subject to a wide variety of responses. For assertions it's more difficult to exploit an abstract model of rational behavior for the type of speech act, because there are so many possible responses for assertions. The number of different sorts of discourse relations that can attach assertions to a context or other material to assertions is large. Accordingly, it's difficult to specify a typical SARG for an assertion. One can either respond with another assertion that is related to the previous assertion by means of some convergent discourse relation (Narration, Elaboration, Commentary (see (21), etc.), by means of some divergent relation (Correction, Counterevidence, etc.) or with a Q-elaboration, an acknowledgement like "OK" or something more complex as in (22), or with a simple prompt for new information:

- (20) (a) A: Smith shot the guard at the bank.
 (b) B: Umm.
- (21) (a) A: I had a bad day at school today.
 (b) B: Gee, that's too bad.
- (22) (a) B: Ah, je vois, au Rocher du diable. (Oh I see, at the Devil's cliff.)
 (b) A: C'est possible, il y avait un gros rocher. (It's possible, there was a big cliff.)

Finally, there are of course again the metatalk relations that can be used to link assertions to questions or requests, either implicit or explicit.

Assertions typically don't get associated with any one particular SARG the way questions and requests do. So the same sort of practical reasoning is more difficult with assertions. On the other hand, assertions that function as conversation entry moves may often have a metatalk function. Initial assertions in a conversation don't get linked up to anything in the context; but they may serve to comment or explain some implicit or about to be made explicit request or question. Understanding the rhetorical function of such metatalk speech acts can be crucial to making the appropriate response (and to inferring the implicit question or request). Grice's work again furnishes us interesting examples of this:

- (23) (a) A: I'm out of gas.
 (b) B: There's a filling station around the corner.

In order for B to have responded the way he did, he has to guess why A is telling him that he is out of gas. B tries to figure out what the rhetorical function of the assertion was. Assuming that A's assertion (23a) is discourse initial, the assertion isn't discourse related to anything. So (23a) could be understood as the beginning of a narrative but it could also be understood as some sort of speech act with different expectations. Given a particular context at hand in which (23a) is the first utterance, B infers that (23a) is a metatalk relation explaining an implicit request for help or information, which then becomes part of the conveyed meaning and generates certain expectations that B then tries to meet with his response. But how do we and B get this? By sincerity, B assumes that what A says is what he believes. Further, he reasons from general world knowledge that being out of gas is not a desirable state and so he concludes that A's SARG behind this speech act is to get some gas. A can then understand B's response as an answer to an implicit question by the sort of reasoning that's familiar, by recreating B's reasoning just above within his model of B's cognitive state. As we shall see in the next section, calculating expectations from speech acts is also a part of implicature and they are a byproduct of SDRS construction and discourse relation inference. The analysis of Gricean implicature sketched here also applies in a rather straightforward way to the analysis of Searle's indirect speech acts.¹¹ So this implicature derives from a reconstruction of the agent's motives for his speech act and thereby a reconstruction of the type of speech act he actually made so as to figure out how to respond.¹²

Before leaving the topic of discourse relations for questions and requests insofar as they are derived from reconstructions of practical reasoning of agents, I want to comment on the assumptions about SARGs for questions as being those for true answers and the difficulties of combining let's say QAP and divergent discourse relations like Correction in discourse. Consider (25):

¹¹ See Danburg-Wyld (forthcoming) for an analysis of Seale's speech acts within SDRT.

¹² While assertions in general have many different sorts of responses, we can say something more concrete once assertions are already part of a discourse context and so linked to some antecedent element by means of a discourse relation. For example, Corrections seem to generate an expectation of agreement or rebuttal (again some divergent discourse relation), something which we can formalize as follows in the glue language of SDRT:

(24) $(\tau, A : \alpha, B : \beta) \wedge \text{Correction}(B : \gamma, A : \alpha) > (\text{Agreement}(A : \alpha, B : \beta) \vee \text{Divergent}(A : \alpha, B : \beta))$

In words, you either take your shot at Correcting the Correction or you acknowledge it. Rhetoric books sometimes codify these expected responses, but there seems to be much work to formulate these expectations clearly and explicitly.

- (25) (a) A: Who went to the Departmental party?
 (b) B: Bill.
 (c) A: No, I know he didn't go. He stayed home and watched the all-star game.

If A attaches B's response to his question with QAP then this entails by the semantics for QAP that B's response is true, something which A doesn't believe. So with what relation should A attach B's response? Something like a possible QAP? It appears we need at least one other type of discourse relation between questions and responses in order to handle this type of configuration. But I won't go into this here.

In this section I've tried to show how a theory of rational action behind speech acts inspired by Grice can help us derive principles about discourse structure. We've derived from the general constraints on cognitive modeling certain discourse axioms for dialogue involving questions and requests as well as discourse expectations for assertions that don't attach in a straightforward way to the discourse context (as when the context is empty). Nevertheless, it is the SDRS level which is essential for telling us whether we have a coherent discourse or not. Q-elab fails in certain cases and the discourse breaks down, and so the theory makes predictions about when discourses fail; the explanation is that speakers aren't following the acceptable rules of verbal behavior. But the reasoning at the SDRT level is much simpler than that at the level of cognitive modeling, and further it doesn't depend on any assumptions about the private beliefs of the speaker. The computation of an SDRS uses only discourse relations whose calculation and justification involves "universal" features about agent's cognitive states.

4. Dealing with Grice II: Implicature

The role of the maxims in Grice's "Logic of Conversation" is to help give an account of certain inferences that people draw from what someone says but that don't follow directly from the literal meaning of what is said. Grice terms these inferences *implicatures*, and they arise as suppositions needed to make the speaker's contribution consistent with the maxims.

Many of Grice's maxims can be viewed as defaults concerning the relation between the cognitive modeling of an agent's state and what he says – e.g., the maxim of Quality or Sincerity as we saw in the last section. The maxim of quantity (say no more than you believe to be true or believe to be relevant) also seems to be one that links the level of information given by discourse to that of cognitive modeling. But not all Gricean maxims are of this nature. Maxims like relevance and manner (in particular, the maxim be orderly) are relevant to the second, SDRT stage of interpretation (getting at the linguistic information given by the discourse). As argued in Lascarides and Asher (1993), orderliness is a default about the basic Narrative

mode: if no other discourse relation suggests itself, link successive assertions in a narrative in such a way (by means of the discourse relation *Narration*) that the events described therein have a temporal order that matches the order in which they are introduced in the text.

From the SDRT perspective, the maxim of relevance falls into two parts. The first is: make your contribution to the discourse such that it can be attached using some discourse relation. In other words, you must attach your contribution to some part of the discourse context by means of some discourse relation that typically fulfills the expectations generated by the attachment point. The second kind of relevance is: your contribution should address the other participant's operative SARG's (those associated with those constituents that are either the current attachment point or superordinate to it in SDRT terms), at least insofar as these can be derived from the discourse itself and an abstract model of rational agency. The first part of relevance is part and parcel of building a coherent discourse structure, linking one's contribution with some part of the discourse context using a discourse relation. This part of relevance is never violated on pain of discourse incoherence.¹³

The second part of the analysis of relevance in SDRT is the one that we have been exploring the last section using practical reasoning. Clearly, there are examples – we will see one below in (32) – where the discourse is coherent but one of the participant's SARG's aren't satisfied. This leads the dialogue to proceed in a certain way.¹⁴

The SDRT approach to implicature is that Gricean conversational implicatures arise as consequences of the calculations of discourse relations for attachment or of expectations of speech acts in SDRT. They consist in that information inferred as a byproduct of computing a coherent discourse structure.

Let's look at an example of a conversation Grice in which an implicature is generated but in which there is no clear violation of a maxim. If objections or other types of divergent discourse relations are possibly expected moves after an assertion, then the following example doesn't violate a maxim but rather shows how additional information is needed to compute the appropriate discourse relation.

- (26) (a) A: Smith doesn't seem to have a girlfriend.
(b) B: He's been paying lots of visits to New York lately.

¹³ In this SDRT is much more like Sperber and Wilson's theory of relevance.

¹⁴ There are other Gricean maxims that fit less well with the picture I have sketched. Many of the maxims of manner – "avoid obscurity of expression", "be brief" and so on are perhaps of use in calculating the speaker's cognitive state and intentions but don't really seem so central as quantity and quality. They fit naturally into a processing account of implicatures such as that of Atlas and Levinson (1981), or Sperber and Wilson (1986). Nevertheless, it appears that these maxims can also be analyzed away in terms of a theory of discourse planning and generation (Dale and Reiter, 1996), which would fit in with the general sort of theory that I want to pursue concerning the interactions of speakers' mental states and discourse structure in dialogue. I can't go into that here, however.

At first hearing, it appears that (26b) is not a coherent response to (26a). But certain intonations such as a L+H% with the rise on *New York* help the interpreter conclude that B is performing some sort of speech act linked by a divergent discourse relation. A different intonation (with the highest pitch somewhere towards the beginning of the sentence and falling off toward the end) on the other hand signals agreement and that somehow B's assertion is intended as evidence for the truth of what A says. Let's look at the first type of intonation. Walker (1994) notices that this same intonation contour works in some Corrections. In the example below, imagine B's response with a falling pitch frequency to the word *New* and then a rapid rise in pitch frequency on the first syllable of *Orleans*.

- (27) (a) A: We bought these pajamas in New Orleans for me.
 (b) B: We bought these pajamas in New Orleans.

The implicature in (27b) is that the pajamas weren't for A. With Walker, I will take the presence of this intonation pattern to mark a Correction which is not mentioned but rather implied.

With this interpretation of the intonation pattern let's return to what we and A can conclude from B's assertion, (26b). From the intonation pattern and the intentionality of behavior, we can conclude a particular SARG: B intended to state a Correction. By the intentionality of behavior assumption, we can also conclude that B intended to utter (26b). However, a Correction must plausibly entail the negation of what it corrects.¹⁵ There is a mismatch between the information supplied by the intonation contour and the compositional semantics, since (26b) by itself doesn't plausibly entail $\neg(26a)$. So Correction (26a), (26b) is blocked. To calculate what the rhetorical function of (26b), we can resort, however, to our general model of rational agency. By the Practical Syllogism that (26b), we can infer that B believes that (26b) provides information by means of which one could derive a Correction; i.e., it provides evidence for the negation of (26a) – or in other words it functions as Counterevidence. In addition (26b) functions as an explanation of the Correction itself. It can be related to (26a) with a metatalk relation; B thinks (26b) explains and verifies his implicit Correction of A's claim. So A, assuming B to be a competent reasoner (charity) and given that this is consistent with what A knows, can take this to be Counterevidence to his claim and bearing a metatalk Result* to the implicit Correction. In (26) practical reasoning helps integrate the information provided by the intonation pattern and particular pair of discourse relations, as well as the implicature that Smith has a girlfriend.¹⁶

¹⁵ For details see (Asher, 1995).

¹⁶ In effect we have derived a much more general default inference rule for counterevidence; it would be this in the glue logic of SDRT:

$$((\tau, A : \alpha, B : \beta) \wedge \text{Corrctn-contour}(\beta) \wedge \neg\text{Corrctn}(\alpha, \beta)) > \text{Counterevidence}(\alpha, \beta)$$

Counterevidence is also subject to certain constraints but I won't go into those here.

Grice also sees (23a) as an example where implicatures are generated. We have seen there too that this language entry move makes sense, but to figure out its rhetorical function (coded by the metatalk relation Result* to an implicit request), we need to figure out the agent's SARG behind the assertion. Like (26) the computation of a discourse relation and an understanding of the rhetorical function of (23a) involves an appeal to an abstract cognitive model of the speaker, but the inference here involves determining a SARG. In (26), the relevant SARG is fixed by the intonation; in that example we must reason about the agent's beliefs as before to infer a particular discourse relation. In both examples, however, the implicatures arise as byproducts of the inferences needed to compute discourse relations in SDRT.

Do examples of maxim flouting behave differently than the examples we have so far considered? Let's consider an example of an apparent violation the maxim of quantity.

- (28) (a) A: I understand that C is your student. What are his qualifications for graduate study?
 (b) B: C has attended all my lectures faithfully and has very good handwriting.

The IQAP principle mentioned earlier should apply in this example. Recall that IQAP says that if A asks a question and then B comes back with an affirmative statement, then typically B's statement is a response to the question designed to impart enough information for A to be able to compute a direct answer. The implicature arises from the reasoning needed to infer the direct answer from what B says. In (28), A asks a WH question, the bound variable of which is categorized as a qualification of C – i.e., a proposition stating a property of C's that is relevant for graduate study. Now given that (28b) expresses a proposition that attributes a property of C, we might expect that it would constitute a direct answer to the question. But the properties attributed to C does not constitute a qualification for graduate study. So we now investigate the chain of reasoning that leads A to the direct answer from what B said.

A can compute a direct answer (what Grice thinks is implicated) from this information using principles about scalar implicature or some other suitable formalization of the maxim of quantity. One trouble with the scalar implicature approach in this example is that a negative response to a question has to be assigned a lower position on the scale than a positive response, and there is no explanation of this in the literature of which I am aware. So for what it's worth, I'll give an alternative derivation of a direct answer and so verify IQAP for (28). I will assume that for all Wh-questions of the form $?_{\lambda x}\phi$, all its direct answers either entail that there are some ϕ s or there are none.¹⁷ I will also assume as is common in the literature

¹⁷ This is quite uncontroversial for most semantics of questions. For a more detailed discussion of this assumption and how it relates to other work in the semantics of questions, see Asher and Lascarides (1998).

on presupposition that there is at least a weak presupposition of the question that there are ϕ s and that negative direct answers somehow cancel this presupposition and that there is a preference to satisfy or accommodate the presupposition rather than cancel it.¹⁸

So let's see how A might reason concerning B's response. IQAP can fire and so, A concludes IQAP between his question and B's response. But now he has to check the constraint on IQAP; that is, he has to be able to derive a direct answer to the question from what he knows, together with B's response. Such a direct answer must either entail that there are ϕ s or that there are none. But given what B says, A cannot compute any answer that entails a positive extension to ϕ (because what he mentions about C aren't qualifications). Furthermore, A reasons that because it is preferable to have presuppositions extant rather than cancel them, B would have given information entailing a positive answer if it were possible. So then B must have indicated a negative answer to the question and this is what A concludes. That is, A interprets B's response that doesn't fit the selectional restrictions on the bound variable in the Wh-question as implying the direct answer *none*. So we have derived the direct answer "none" from the response, and so verified that IQAP holds between (28a) and (28b). This inference would hold regardless of the Wh-question and the response as long as the response implies in the sense that we have seen that there are no relevant elements that meet the selectional restrictions on the variable in the Wh-question.

On the SDRT view, what is taken to be a Gricean implicature behind such responses as that evident in (28) is just the implied direct answer to the question. This fits with our analysis of Grice's other examples. Implicatures simply seem to arise from the inferences needed to make the appropriate attachments. But there are more stark apparent violations of the maxims that one could imagine. Here is one example, which one might be tempted from an SDRT point of view to call an incoherent discourse.

- (29) (a) A: Is C having an affair?
(b) B: So how about those Giants? Made the playoffs!

Does this example really have a discourse incoherence in that B makes plain that he is not connecting his assertion to the previous discourse context? Alternatively, could B just be showing that he refuses answer the question? On this second view, the discourse is coherent and B's assertion is just another example of metatalk. I leave open which way the analysis should go on such examples.

Many of Grice's examples of implicature seem to be just examples of computing an appropriate discourse relation, sometimes through the use of practical reasoning other times through the careful analysis of discourse clues. But perhaps not all of his examples are homogeneous. Let's consider yet another of Grice's examples.

¹⁸ Though I talk here of cancellation, the preference I just mentioned can equally be expressed by Van der Sandt's preference for global over local accommodation.

- (30) (a) A: Where does C live?
 (b) B: Somewhere in the south of France.

In (30b) B does give a direct answer to A's question (30a).¹⁹ But there are more precise answers that could be given; C's location could be made more precise. Grice imagines that in this context B knows that A's SARG is to get an address. In this case, we see the second part of relevance violated here; B has supplied an "inappropriate" answer in the sense of Asher and Lascarides (1998), in that it does not answer any of A's question related goals. Now appropriate answers may be difficult to devise, because the precise SARG's of the questioner may not be able to be determined in the abstract. But if A's SARG is mutually known as in the scenario Grice imagines, then B's response can only be interpreted as a means that B has not taken A's SARG on board through cooperativity (for whatever reason – the theory leaves that open).

Given my treatment of Gricean examples in this section and my discussion of discourse relations in the last section, it might seem as though there are no incoherent dialogues. But there are some responses to questions in a dialogue that can't be linked in an appropriate way. (31b) is a real live example due to Ellen Prince (p.c.):

- (31) [French teacher has just finished a lecture on the subjunctive]
 (a) Teacher: So are there any questions?
 (b) Student: Yes, are these tennis balls the ones that I am supposed to get for gym class?
 (c) Student: Yes, can I go to the bathroom?

If we think about the context and the question asked by the teacher, there is a domain restriction of the quantifier *any questions* (cf. von Stechow (1994), and an implementation of his ideas in (Asher and Lascarides, 1998)) to questions on the topic of the French subjunctive. The student misses filling in the presupposition on the restrictor of the quantifier, and so gives something to the teacher that isn't really an answer. Pretty clearly, it doesn't supply an answer to the teacher. Perhaps it might be a way of indicating that the student has not taken on the teacher's SARG, but that's still pretty indirect. So we can't attach with any relation and we predict an incoherence.

¹⁹ See Asher and Lascarides (1998) or Ginzburg (1995) for a defense of this view; some theories of questions like Groenendijk and Stokhof's wouldn't consider this a direct answer but rather a partial answer. If one wishes to take their approach, then IQAP and QAP should all be understood in terms of partial answerhood.

5. Coming to terms with Grice III: From discourse structure to SARG's

In the first section on Grice and SDRT, I showed how an abstract theory of cognitive modeling could yield interesting axioms about discourse structure in dialogue and give us a range of expected discourse relations giving rhetorical function. Now I want to look at something like the converse to this claim. Can discourse structure teach us anything about agent's conversational goals? Yes, quite a bit. We have already seen that by reasoning about what agents say using the practical syllogism and other elements, we can sketch in what their cognitive state might be like. But further, facts about attachment indicate, it seems, when an agent's SARG's have been satisfied (or dropped). Here is an example of a dialogue collected for the Franco-German project Procope in Toulouse and Stuttgart that makes the point.

- (32)
- (a) A: Je suis tombé en panne. Peux-tu m'aider? (I have had a breakdown. Can you help?)
 - (b) B: Où es-tu? (Where are you?)
 - (c) A: Je suis devant le refuge qui se trouve à environ un km après Couiza. Il y a là une cabine téléphonique. (I am in front of the refuge that is about 1 km after Couiza. There is there a telephone booth.)
 - (d) B: Il y a plusieurs refuges aux alentours de Couiza (i). Dans quelle direction es-tu parti de Couiza? (ii) (There are several refuges around Couiza. In which direction did you leave Couiza?)
 - (e) A: Je suis sorti par la route Paul Sabatier. Puis j'ai roulé vers la montagne. A une clairière j'ai tourné à droite. (I left by the Paul Sabatier road. I then drove toward the mountains. At a clearing I turned left.)
 - (f) B: Au grand carrefour? (at the big intersection)
 - (g) A: Non, après, là où on commence à avoir une belle vue sur la mer. (No afterwards, where you begin to have a nice view of the sea.)
 - (h) B: Ah, je vois, au Rocher du diable. (Oh I see at the Devil's cliff.)
 - (i) A: C'est possible, il y avait un gros rocher. (It's possible; there was a big cliff.)
 - (j) B: Donc tu es à la Maison de l'aigle. J'arrive tout de suite. (So, you are at the house of the eagle. I am coming right away.)

In this example, B asks a question at a certain point (32b). A attempts to give an answer that satisfies B's QRG's (32c). B persists, however, in asking a question (32dii) and thus forms a Q-elab on the first question. B is attempting to get an

answer that satisfies his QRG's for the first question (knowing the location of A). But then B answers his own question in (32h). Once this happens, we know that B's question is answered in such a fashion that is QRG's are satisfied and then he can go on to accomplish other conversational goals (in the first case coming to A's rescue and in the second giving instructions to A so that he can come to the meeting place with B). It is this self-answering in these dialogues that let's us know that B has satisfied his QRG's and that we can now pop to a new part of the discourse context. I suppose that this is an important way in which discourse structure itself can tell us when a participant's SARG's are satisfied (or dropped) and gives us another way of getting insights about cognitive models from discourse.

6. Cooperativity doesn't always work

Our discourse relations for dialogue have been derived usually from the assumptions of cooperativity and sincerity; the speaker takes over the other participant's goal and says the truth insofar as he or she knows it. But in many situations and for many reasons, speakers aren't being cooperative or sincere, or at least not completely. For example, speakers may say things to flatter the other participant (cf. for example, Brown and Levinson (1978) and the notion of "positive face" developed there), and this may lead to an insincere response to a question or to an untruthful assertion. This approach to discourse can have disastrous consequences, as for example in this response by the Colombian air traffic control authorities to an American Airlines pilot (from Gibbon and Ladkin, 1996).

- (33) (a) American Airlines Pilot: Can American Airlines 965 go direct to ROZO and then do the ROZO arrival, sir?
 (b) Cali Controller: Affirmative direct ROZO one and then runway one nine, the winds calm.

As discussed in Gibbon and Ladkin (1996), the response *affirmative* by the controller cannot be correct, since a controller may only say this if what the AA pilot was requesting was a possible clearance, which he was not in this context. So what was the ground controller doing? One hypothesis is that the standards of politeness in his language community did not allow him to correct overtly a pilot, which lead to disastrous consequences.

Cooperativity may be overridden when the speaker has antecedently established goals that conflict with a SARG of the other participant. Such conflicts may very well preclude relations like Q-elab or IQAP between the turns. Instead, we could expect metatalk relations explaining why an answer to a question cannot be given or indicating that the speaker does not share the other participant's SARGs.

7. Conclusions

The question I started with was whether SDRT as a theory of the pragmatics semantics interface was able to analyze Gricean phenomena. The prognosis seems to be pretty good for a unified and formal theory of the pragmatics and semantics interface. I have eliminated Grice's notoriously vague maxim of relation using SDRT's notion of discourse update, the attachment of new information by means of some discourse relation. I have shown that Gricean conversational implicatures are a byproduct of computing an appropriate discourse relation for the speaker's contribution. This has allowed us to work through certain of Grice's examples quite precisely in a way that other approaches have not (for instance, Roberts, 1996). The SDRT approach has made precise the intuitions behind the Gricean view of conversational implicature.

The Gricean perspective on meaning has, however, also added to the SDRT approach to dialogue, for it has led us to look at the interaction between the speaker's cognitive state and discourse structure. I developed a cognitive model logic similar to SDRT's glue logic as a simple but efficacious way to reason about speech acts as rational actions. I used an abstract cognitive model of a speaker as rational agent and ideas of cooperativity and truthfulness to derive discourse relations for dialogue that in turn determine what counts as a coherent response in a conversation. We have seen the need for IQAP, Indirect Request-Acknowledgment Pair (IRACKP), metatalk relations, and Question-Elaborations. There are some other relations that we haven't mentioned: Q-narration (And then what happened?) and relations having to do with plans, Plan-Narration and Plan-Elaboration. A hopeful sign for the theory of discourse relations is that it appears that a theory of agents can go some way towards giving us a good idea of the range of discourse relations in dialogue.

Unlike other approaches in pragmatics or AI that exploit cognitive models, however, we don't have to model the goals and beliefs of individual speakers in each conversation, and the cognitive modeling of individual agents isn't needed as a rule to determine coherence in dialogue. It is the construction of an SDRS that determines coherence. In most cases dialogues run as planned using the discourse relations derived from the abstract cognitive model. In some cases as in indirect speech acts or in Grice's example (23), we may need to resort to more detailed world knowledge about probable speaker goals and beliefs in order to formulate a cooperative response. As we have also made clear in our abstract cognitive model, however, cooperativity is also just a default and other goals can override a speaker's taking on board another participant's SARGs. Further research will hopefully make sense of these more difficult interactions based on those beliefs and intentions that are not introduced through the language.

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CHAPTER 2

On the Semantic and Pragmatic Polyfunctionality of Modal Verbs

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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1. Introduction

The line between semantics and pragmatics is sometimes drawn with the help of a notion of context: pragmatics would be the study of meaning in context and semantics would abstract meaning away from context (cp. Levinson, 1983, p. 22). Dividing the study of meaning in this way could make traditionally semantic concerns such as vagueness, ambiguity and homonymy land in pragmatics, for undoubtedly the choice of one of the two or more possible readings of a vague or ambiguous word or the identification of one of two homonyms will be context-dependent. In this paper I sketch a general typology of context-dependent meaning or “polyfunctionality” (§2). It is traditional, in that vagueness, ambiguity and homonymy remain semantic concerns, i.e., aspects of “semantic polyfunctionality”, to be distinguished from “pragmatic polyfunctionality”.

One area in which polyfunctionality abounds and which has long intrigued linguists is modality. Consider the English modal verb *may*.

- (1) (a) To get to the station, you *may* take bus 66.
- (b) You *may* leave now.
- (c) John *may* have arrived.
- (d) Long *may* he live!

In (1a) *may* refers to some general possibility; in (1b) *may* is involved in the expression of a permission, be it that in some contexts this permission may count as an order; in (1c) *may* expresses the speaker’s uncertainty; and in (1d) *may* expresses a wish on the part of the speaker. That English has different “uses” or “functions” is not controversial. There is no agreement, however, on the question whether these different uses are based on different meanings or not. An essentially negative answer is given by Perkins (1983), an essentially positive one by Palmer (1979), and Coates (1983) supplies a mixed answer. The typology of polyfunctionality (Section 2), coupled with a typology of modality (Section 3) will allow me to answer this question anew and will thereby demonstrate that both typologies are workable.

2. Types of polyfunctionality

The English word *grandfather* has only one “meaning”, viz. ‘father of one’s father or mother’. It can be said to have two “uses” or “functions”, implicitly indicated by the disjunction in the gloss. Some languages endow the two uses with different words. Swedish, for example, has *farfar* for the paternal grandfather and *morfar* for the maternal one. Compared to the meaning of the Swedish kinship terms *farfar* and *morfar*, the meaning of English *grandfather* can be said to exhibit “vagueness” (see, e.g., Kempson, 1977, pp. 128–134) – another term is “generality” (see, e.g., Lyons, 1977, p. 409; Cruse, 1986, p. 51).

The vagueness of a word is one type of “polyfunctionality”. To some extent it can be distinguished from the “ambiguity” of a word. When linguists call a word “ambiguous” they mean that one word does not merely have two uses, but two meanings or, more precisely, at least two meanings. For any particular word, however, the distinction between uses-but-not-meanings and uses-and-meanings may be hard to draw and is speaker-specific. Take the English adjective *gay*. The *COLLINS COBUILD English Dictionary* supplies three paraphrases. Relevant now are just two: (i) of a person, lively, and (ii) of an object, brightly colored. For most speakers these meanings are probably felt to be closely related and some will consider them manifestations of just one meaning ‘lively, pleasant’, but two uses, one for people and another one for objects. This illustrates the indeterminacy of the distinction between vagueness and ambiguity. But while it is important to be aware of this, it is equally important to be aware of the existence of cases like *grandfather*, of which everyone is likely to agree that its meaning is vague, and *bank* as ‘raised edge of a river’ vs. ‘financial institution’, of which everyone is likely to agree that is ambiguous.

Within ambiguity itself there is a cline of synchronic relatedness, again speaker-specific. Take *gay* again. The *COLLINS COBUILD English Dictionary* supplies a third paraphrase: (iii) of a person: homosexual. We thus have two usages applying to people: ‘lively, pleasant’ and ‘homosexual’. For modern speakers they will be considered to be two different meanings, but people may hold different judgments as to whether the two meanings are synchronically related. In case the two meanings are felt to be synchronically related, one can speak about the word being “polysemous”. If they are felt to be synchronically unrelated, one can call the word “homonymous”. The case of English *gay* illustrates the indeterminacy of the distinction between polysemy and homonymy. Again, it is important to recognize there are clear cases too. The *bank* example is a good illustration of undisputed homonymy; *sentence* with its grammatical and judicial uses – ‘clause’ and ‘court decision’ – is a good case of polysemy.

The degree of relatedness characterizing the cline between polysemy and homonymy may be looked at from a diachronic angle. Typically, polysemy is due to the semantic divergence of the uses associated with one meaning, a process which must have happened with the modern ‘lively’ and ‘homosexual’ meanings of *gay*. But consider the English noun *shock*, in its meanings ‘mass of thick hair’ and ‘grain sheaves stacked together’ – I am disregarding the homonymy between these meanings and the ones that relate to a sudden movement or an upsetting event. As Lyons (1981, p. 46) argues, these two meanings are probably considered to be synchronically related, so *shock* is polysemous. Diachronically, however, they have different etymologies. In the case of homonymy, too, there are two diachronic scenarios, but it is not clear which scenario is the unmarked one. Homonymy regularly results from the formal convergence of words with different meanings, as with *down* meaning ‘at/towards the bottom’ and ‘feathers of young birds’. But it seems quite regular also for a polysemous word to see its senses drift

Table 1
Types of semantic polyfunctionality

S I M I L A R I T Y	high	i d e n t i t y	one meaning	at least two uses		<i>grandfather</i>	vagueness	
	at least two meanings (and uses)		meanings synchronically related	deriving from one meaning of one word	<i>gay</i>	polysemy	ambi- guity	
				deriving from two meaning of two words	<i>shock</i>			
			meanings synchronically not related	deriving from one meaning of one word	<i>fast</i>	homonymy		
				deriving from two meanings of two words	<i>down</i>			
	low							

so far apart that they seem unrelated at a later stage, as with *fast* meaning ‘speedy’ as well as ‘steady’.

Table 1 summarizes the various distinctions. The essential idea and the terminology are standard, but by no means universal. Interestingly, a linguist may accept the idea of the cline but this does not mean that (s)he welcomes it. Compare the almost annoyed acceptance in Lyons (1977, p. 552) with the hypothesis that a typology of this kind should be the basis of any sound lexical semantics (Tuggy, 1993) or should be reformulated in “procedural” terms (Geeraerts, 1993). Note, finally, that the typology has been argued for on the basis of hopefully convincing examples. The literature tries to further support the typology with “explicit criteria” and “diagnostic tests”. It seems to me that the successfulness of such criteria and tests is also a matter of a cline: some tests do better, some worse. The issue, however, is beyond the confines of this paper, not least because discussions of the polyfunctionality of modality markers have not referred to criteria or tests.

The caption of Table 1 includes the word “semantic”. This is to capture the fact that each of the meanings is highly conventionalized, to the extent that the depository of the lexical semantics of a language, the dictionary, will have to take account of them. Even in the case of vagueness and its multiple single meaning-based uses, the dictionary will reflect the multiplicity of uses, either explicitly, as when *grandfather* is defined as ‘father of one’s father or mother’, or implicitly, when *mammal* is taken to apply to hundreds of kinds of animals. Next to semantic polyfunction-

Table 2
Types of pragmatic polyfunctionality

one meaning	at least two uses	only one use is fully conventionalized and its relation to the one or more uses that are not or less conventionalized can be characterized in terms of	specificness	<i>grandfather</i>
			metaphor	<i>mother</i>
			metonymy	<i>pamper</i>

Table 3
From pragmatic to semantic polyfunctionality

pragmatic polyfunctionality →	semantic polyfunctionality	
	polysemy	→ homonymy

ality, there is another kind of polyfunctionality, which can be called “pragmatic” and is not or less conventionalized. This is what we find when a word is meant in a way that flouts the semantics. Either the intended meaning is more general than the semantics, as when one uses *grandfather* for any old man, not just the father of one’s father or mother, or it is related metaphorically, as when one uses *mother* to characterize a certain node in a generative grammar tree, partially resembling a kinship tree, or metonymically, when one uses *pamper* to denote a pamper-wearing baby. Table 2 summarizes the typology of pragmatic polyfunctionality.

The distinction between semantic and pragmatic polyfunctionality is again a matter of degree; uses conventionalize into meanings to a higher or lower degree, and possibly to a different degree for different people. If pragmatic polyfunctionality conventionalizes, it feeds into polysemy – and polysemy, we have seen, may feed into homonymy.

3. Types of modality

Modality and its types can be defined and named in various ways. There is no one correct way. In this paper I will rely on the proposal offered in van der Auwera and Plungian (1998). The full motivation will not be repeated here. I will, however, present the terminology and illustrate it.

Van der Auwera and Plungian (1998) propose to use the term “modality” for those semantic domains that involve possibility and necessity as paradigmatic variants, that is, as constituting a paradigm with two possible choices, possibility and necessity. They take this to be the case in just four domains. One is “participant-internal modality”, referring to a kind of possibility or necessity internal to a participant engaged in the state of affairs. In the case of possibility, we are dealing with a participant’s ability (capacity), as in (2a), and in the case of necessity, with a participant’s internal need, as in (2b).

- (2) (a) Boris *can* get by with sleeping 5 hours a night.
 (b) Boris *needs* to sleep 10 hours every night for him to function properly.

The second domain in which possibility and necessity contrast is that of “participant-external modality”. The term refers to circumstances that are external to the participant, if any, engaged in the state of affairs and that make this state of affairs either possible or necessary.

- (1) (a) To get to the station, you *may* take bus 66.
 (3) To get to the station, you *have to* take bus 66.

In (1a) the participant-external modality is possibility: bus 66 offers just one means of transport making it possible for the hearer to get to the station. In (3) the participant-external modality is necessity: bus 66 happens to be the only means of transport that will get the hearer to the station. Hence, to reach the station bus 66 becomes a necessity. In case the external circumstances involve some person(s), often the speaker, and/or some social or ethical norm(s) permitting or obliging the participant to engage in the state of affairs, we can call the modalities “deontic”, as in (1b) and (4).

- (1) (b) You *may* leave now.
 (4) You *must* leave now.

The last domain is “epistemic modality”. It involves a judgment of the speaker: a proposition is judged to be uncertain – epistemic possibility – or probable – epistemic necessity – see (1c) and (5).

- (1) (c) John *may* have arrived.
 (5) John *must* have arrived.

Markers of modality typically have uses other than signaling modality. In the history of these markers these other uses either precede or follow one or more modal uses. The former will be called “premodal” and the latter “postmodal”. An example of a modal marker occurring in both a modal and a premodal use is shown in (6).

- (6) (a) I *have* a book.
 (b) I *have to* go.

have in its possession use is premodal; the obligational use is a further, modal development. Another one is French *savoir*: it has both a premodal ‘know that’ use and a modal ‘know how to’ use.

Table 4
Types of modality

Possibility			
Non-epistemic possibility			Epistemic possibility (Uncertainty)
Participant-internal possibility (Dynamic possibility, Ability, Capacity)	Participant-external possibility		
	(Non-deontic possibility)	Deontic possibility (Permission)	
Participant-internal necessity (Need)	(Non-deontic necessity)	Deontic necessity (Obligation)	Epistemic necessity (Probability)
	Participant-external necessity		
Non-epistemic necessity			
Necessity			

- (7) (a) Je *sais* qu'il est temps.
I know that.it is time
'I know that it is time.'
- (2) Je *sais* nager.
I can swim
'I can swim.'

For an example of a marker that has both a modal and postmodal use we can go back to *may* in (1). It can be argued that the uses of *may* illustrated in (1a–c) are all modal, but that the optative one in (1d) is not. Of course, the claim that the use in (1d) is not modal crucially refers to a restricted notion of modality, requiring a contrast between possibility and necessity. With an optative, there is no such contrast and we are not surprised, therefore, to find languages expressing a wish with a postmodal marker that is a necessity marker in its modal use. A case in point is the Russian modal infinitive, illustrated in (8).

- (8) (a) *Žit'* vam do sta let!
live.INF 2PL.DAT till hundred.GEN year.PL.GEN
'May you live a hundred years!'
- (1) Vam *vyxodit'*.
2PL.DAT go.out.INF
'You must get off.' [as on the bus]

Another example of a marker that has both modal and postmodal uses is English *should*.

- (9) (a) You *should* go home now.
(2) *Should* he not be home, call him at the office.

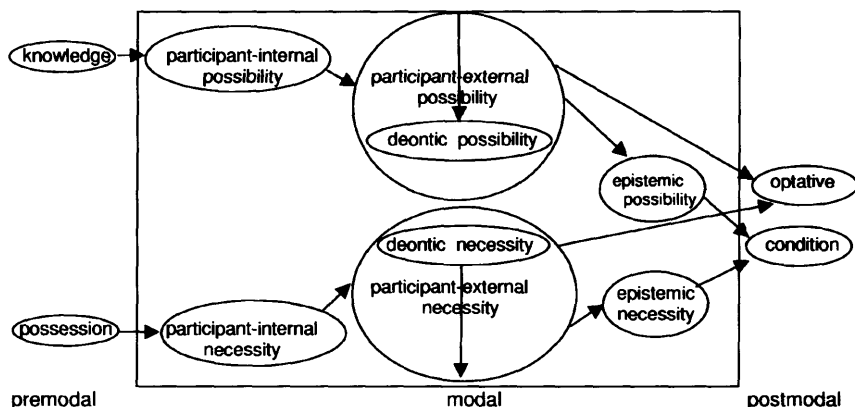


Fig. 1. A part of modality's semantic map.

In (9b) *should* has become a conditionality marker; it does not express necessity anymore; and this use developed out of a modal use. A nice illustration of the fact that conditionality does not distinguish between possibility and necessity is that the translational equivalent of (9b) in Dutch uses the possibility modal.

- (10) *Mocht* hij niet thuis zijn, bel hem dan op zijn kantoor.
 might he not home be ring him then on his office
 'Should he not be home, call him at the office.' (= 9b)

Starting from the modal "tracks" and "paths" offered by Goossens (e.g., 1987) and Bybee (especially Bybee, Perkins and Pagliuca, 1994), van der Auwera and Plungian (1998) chart a cross-linguistic semantic map for premodal, modal and postmodal uses. Figure 1 represents a part of this map. It charts the basic modal centre, premodal possession and knowledge, and postmodal conditionality and optative.

The arrows indicate that one use develops into another use. A marker of possession, for instance, can develop into a marker of participant-external necessity – the case of English *have*. Both epistemic possibility and necessity can go to condition – the case of English *should* and Dutch *mocht* 'might'. Or, as a final illustration, Figure 1 also contains a path arrow going from participant-internal possibility to participant-external possibility and further to epistemic possibility. This path was followed by English *may*. Within participant-external possibility, the possibility marker may specialize to deontic possibility, a development followed by Dutch *mogen* 'may'. Different from its English cognate, Dutch *mogen* is not used for general participant-external possibility any more, only for the deontic subtype. In other words, Dutch uses *may* for the translational equivalent of (1c), but not for that of (1b).

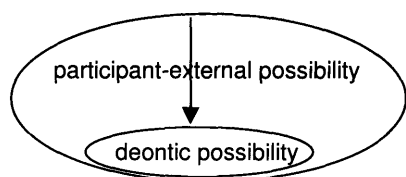


Fig. 2. Specialization.

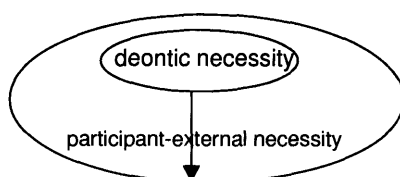


Fig. 3. Generalization.

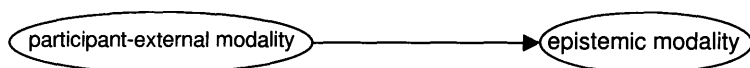


Fig. 4. Metonymy or metaphor.

- (11) (a) *Om naar het station te gaan, *mag* je bus 66 nemen.
 in.order to the station to go may you bus 66 take
 'To get to the station, you *may* take bus 66.' (= 1b)
- (b) Je *mag* weggaan nu.
 you may leave now
 'You *may* leave now.' (= 1c)

The uses on the map are plotted with elementary set-theoretical means. This allows for a simple representation of the hypothesis that deontic modality is a subtype of participant-external modality: the representation of the former is included in the representation of the latter. I can also depict three types of semantic change:

1. semantic specialization, as when the participant-external possibility use gets narrowed down to deontic possibility – Figure 2;

2. semantic generalization, as when the deontic subtype of participant-external necessity expands to the participant-external necessity as such; this process arguably took place with English *should* and its Germanic cognates (Ramat, 1972, pp. 195–200) – Figure 3;

3. metonymy or metaphor, as when participant-external modality develops into epistemic modality (see, e.g., Traugott (1989) and Goossens (forthcoming) on metonymy and Sweetser (1990) on metaphor) – Figure 4.

In terms of the typology of polyfunctionality of Section 2, the change through specialization is an entirely semantic process: a semantically polyfunctional element loses some of its polyfunctionality. The other types of change start from pragmatic polyfunctionality, which then conventionalizes into semantic polyfunctionality.

The discussion of the full semantic map in van der Auwera and Plungian (1998) does not go into the question whether a use or function is also a meaning. The reason is that their analysis focuses on the cross-linguistic validity of the map.

From a cross-linguistic point of view distinguishing between vagueness, polysemy and homonymy is not a prime concern (cp. also Haspelmath, 1997, pp. 58–62). It can only be a language-and-marker-specific concern and what may be vagueness in one language, need not be such in the next language. It is this issue that I will turn to in the next section.

4. Types of modal polyfunctionality

4.1. Semantic polyfunctionality: vagueness and polysemy

Modal verbs are a preeminent case where linguists hold different opinions on polyfunctionality. The debate usually confronts vagueness and polysemy views. But not always, as we will see in Sections 4.2 and 4.3, homonymy is a relevant concern too, and so is pragmatic polyfunctionality.

Let us first look at the example in (1) again.

- (1) (a) To get to the station, you *may* take bus 66.
- (b) You *may* leave now.
- (c) John *may* have arrived.
- (d) Long *may* he live!

What everyone probably agrees on is (i) that (1) illustrates four uses of the English modal *may*, (ii) that they have all been conventionalized, and (iii) they are all semantically related. The acceptance of (ii) rules out a pragmatic analysis, and that of (iii) rules out a homonymy analysis. So we are left with the vagueness and polysemy hypotheses applied to all or some of the uses in (1) or with a view that for all or some uses in (1) no clear answer can be given and the relevant *may* use is indeterminate with respect to vagueness and polysemy.

Is this issue decidable? I propose that it is. With respect to English *may*, I propose the following hypotheses:

(i) Deontic *may* in (1b) is not different from participant-external *may* (1a). The reason is that there is no feature, formal or semantic, that distinguishes the deontic use of from the participant-external use other than the fact that deontic possibility is a special case of participant-external possibility. In other words, participant-external *may* is vague with respect to the feature [\pm deontic]. Note that this statement is specific to English *may*. It does not entail that deontic possibility can never attract a meaning separate from participant-external possibility. The Dutch cognate *mogen* is a case in point. Example (11) has already shown that Dutch *mogen* has a deontic use but not the general participant-external one. This use is furthermore formally separate from all its other uses, e.g., in allowing a valency slot for the permitter.

- (12) Je *mag* van mij weggaan.
 you may from me leave
 'You have my permission to leave.'

Hence the deontic use is based on a separate deontic meaning.

(ii) Participant-external *may* (1a–b) is separate from epistemic *may* (1c). The collocational features of both *may*'s are different. For instance, when *may* cooccurs with *have* and a past participle, it can only be epistemic (Coates, 1983, p. 137). The obligatory epistemicity of the collocation cannot be due to the *have* + past participle part, for in (13) we also see a possibility modal followed by *have* and a past participle, and the resulting meaning may be epistemic, but it need not.

- (13) John *could* have arrived in time.

Hence the epistemic meaning of *may* + *have* + past participle must in part reside in the fact that we are dealing with a separate kind of *may*, to wit, an epistemic *may*. Note that we cannot say that the epistemic meaning results from combining a general possibility meaning, vague between a non-epistemic meaning and an epistemic meaning, with the meaning of *have* and that of the past participle, for then the meaning of the sum would be greater than that of its parts. At best we could say that the epistemicity accrues to the *may* + *have* + past participle construction as a whole – in the spirit of Construction Grammar (e.g., Goldberg, 1995), but this hypothesis also entails that there is a special, separate *may* "locked up" in the construction and partaking in its epistemicity.

(iii) Participant-external (1a–b) and epistemic *may* (1c) are also separate from optative *may* (1d). The latter has a special collocational feature: it obligatorily occurs in first or second clause position. The optative meaning is not associated with verb-first or verb-second position as such, so it must in part reside in the meaning of the modal – a hypothesis to be argued for along the same lines as that on a separate epistemic *may*.

Are there any more meanings? Maybe not. A case could be made for a participant-internal possibility meaning as perhaps in (14) (cp. Jacobsson, 1994, p. 168; van der Auwera and Plungian, 1998, p. 90).

- (14) She deals with it as best as she *may*.

There is no doubt that *may* once expressed participant-internal possibility, and if the equative clause in (14) expresses this then this *may* could be taken to illustrate a relic meaning. In that case, the set phrase nature of the equative clause sets participant-internal possibility apart from the other meanings. But perhaps the possibility of (14) is participant-external and the equative clause of (14) just means 'as best as circumstances allow'. Another candidate for the status of a separate meaning is the "concessive" use, illustrated in (15) and called "quasi-subjunctive" by Coates (1983, p. 132).

- (15) He *may* be a genius, but that is a mistake.

As far as I can see, however, the concessive use is merely a use of epistemic *may*. The contrast with Dutch *mogen* is interesting again. Dutch *mogen* does have a separate concessive meaning; it cannot be seen as a special use of a more general epistemic meaning, for the latter does not exist (any more.). So Dutch has an exact parallel to (15), but not to (1c).

- (16) (a) Hij *mag* een genie zijn, maar dat is een fout.
 he may a genius be but that is a mistake
 ‘He may be a genius, but that is a mistake.’
- (2) *John *mag* aangekomen zijn.
 John may arrived be
 ‘John may have arrived.’

To conclude this illustrative section on English *may*, I propose that English *may* is polysemous between a participant-external possibility meaning, an epistemic meaning and an optative meaning – perhaps also a recessive participant-internal possibility meaning. So-called “deontic” and “concessive” readings manifest the vagueness of, respectively, participant-external and epistemic possibility.

Note that the above claim is inherently item-specific. What holds for *may* need not – and does not in fact – hold for *can* or even the formally related marker *might*. And being an item-specific matter makes it a language-specific matter as well. The story of *may*’s Dutch cognate *mogen* is different.

4.2. Semantic polyfunctionality: polysemy and homonymy

The difference between polysemy and homonymy is one of degree of semantic relatedness. Though one cannot really “measure” semantic relatedness, the semantic map proposal does allow one to describe two factors that could influence the degree of semantic relatedness:

(i) Meanings are more related the fewer intermittent meanings have to be postulated. Consider the abstract map in Figure 5.

Meaning 1 is closest to meaning 2, a bit less close to meaning 3, etc.

(ii) Meanings are more related if the area covered by a modal marker on the semantic map has fewer interruptions. Imagine a modal marker with the meanings shown in Figure 6. The black background indicates that the marker can express the meaning.

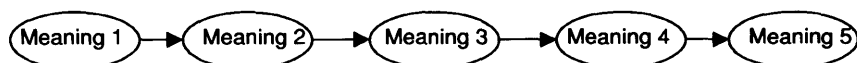


Fig. 5. A path of meanings.



Fig. 6. A path of meanings, with an interruption.

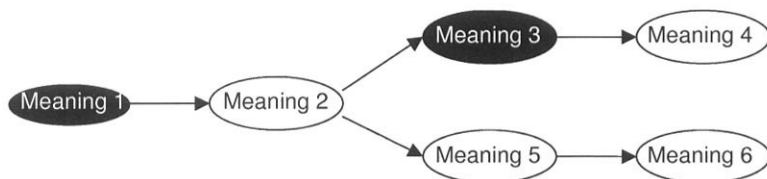


Fig. 7. Interruption in a modal path: unattested.

Meaning 4 is lacking. It must have existed at some point, for otherwise meaning 5 would never have resulted, but for some reason meaning 4 has now dropped out of use. By the first criterion meaning 3 is as close to meaning 1 as it is to meaning 5. The second criterion, however, says that the existence of the intermediate meaning 2 makes meanings 1 and 3 closer to each other than meanings 3 and 5, which lack connecting meaning 4.

From the work reported on in van der Auwera and Plungian (1998), it would seem that the relevance of these factors is minimal, however. The chains of relevant meanings are usually quite restricted in length, seldom, e.g., containing 5 elements such as shown in the imaginary example of Figure 5 and the meanings are usually contiguous, i.e., the chain is uninterrupted. This means that the relevant meanings are usually highly related and that the decision about the polyfunctionality of the modal is one between vagueness and polysemy. However, interruptions in the chains of modal markers do occur. In van der Auwera and Plungian (1998) it is stated that meanings may be unconnected but only if they occur on different branches following a split. Consider the abstract maps in Figures 7 and 8.

The situation in Figure 8 can be illustrated with Dutch *mogen* 'may'. Its expressive power is shown on Figure 9.

Two of the meanings have already been illustrated in the above. Thus the deontic meaning is illustrated in (11) and (12) and the concessive one in (16). Dutch *mogen* allows an optative meaning, similar to the optative of English *may*, shown in (1d).

- (17) *Moge* hij honderd jaar worden!
 may he hundred year become
 'May he live to a hundred!'

The 'like' meaning, unparalleled by English *may* – but with a counterpart in German *mögen* – is illustrated in (18).

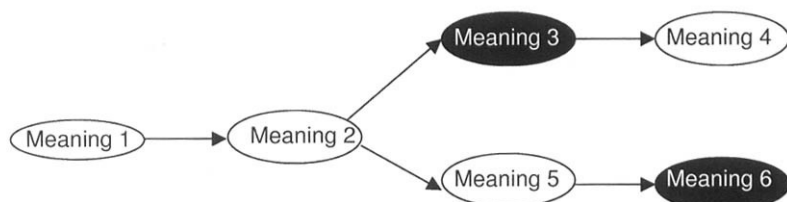
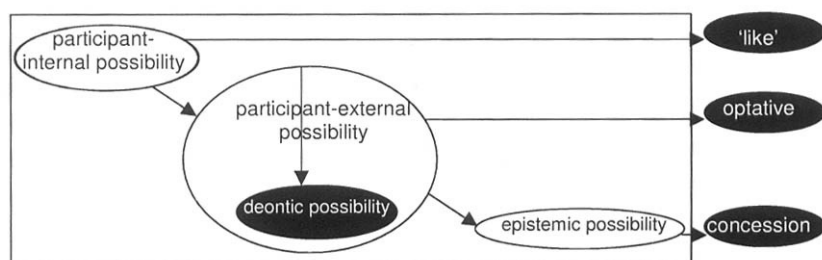


Fig. 8. Interruption in a modal path: attested.

Fig. 9. Dutch *mogen* 'may'.

- (18) Ik mag geen soep.
 I may no soup
 'I don't like soup.'

At present there are no direct links between the four modern functions of Dutch *mogen*, which makes them good candidates for homonym status.

4.3. Pragmatic polyfunctionality

It is a fact that one can use deontic *may* and actually not mean to convey any permission, but rather an order, be it an indirect one – in Gricean terms, as a Quantity-2 implicature (van der Auwera, 1996, p. 191). Consider (1b) again.

- (1) (b) You *may* go now.

Imagine (1b) uttered by general talking to a sergeant who was called into the general's office, at what must clearly be the end of their conversation. (1b) will then function as a command to leave. This use, I assume, has to be considered an illustration of pragmatic polyfunctionality: nobody will want to claim that English *may* can conventionally mean 'must'. But, of course, in modal territory no less than in other areas of the lexicon pragmatic uses may conventionalize. *must*, as well as its

cognates in German and Dutch, were once possibility modals. Now they are necessity modals, and their possibility use may have come about in the way sketched for (1b). The possibility use later conventionalized and ousted the original possibility meaning. In a transition phase, these modals must then have been semantically polyfunctional, more specifically, polysemous. In Danish, the 'must' modal is still in the polysemy stage.

- (19) Nu må du fortælle.
 now may/must you tell
 'Now you may/must tell a story.' (Davidsen-Nielsen, 1990, p. 187)

5. Conclusion

In this paper I looked at the notion of context-dependent meaning or polyfunctionality. I hoped to make clear how it has a role both in semantics and in pragmatics and how both roles are related. The general point was illustrated with some hypotheses about modal verbs, especially English *may* and its Dutch cognate *mogen*.

Abbreviations

2	second person
DAT	Dative
GEN	Genitive
INF	Infinitive
PL	Plural

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CHAPTER 3

The Semantics-Pragmatics Distinction: What It Is and Why It Matters

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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The distinction between semantics and pragmatics is easier to apply than to explain. Explaining it is complicated by the fact that many conflicting formulations have been proposed over the past sixty years. This might suggest that there is no one way of drawing the distinction and that how to draw it is merely a terminological question, a matter of arbitrary stipulation. In my view, though, these diverse formulations, despite their conflicts, all shed light on the distinction as it is commonly applied, in both linguistics and philosophy. Although it is generally clear what is at issue when people apply the distinction to specific linguistic phenomena, what is less clear, in some cases anyway, is whether a given phenomenon is semantic or pragmatic, or both. Fortunately, there are other phenomena that are uncontroversially semantic or, as the case may be, uncontroversially pragmatic. Their example will help us get clear on what the semantics-pragmatics distinction is.

1. Rationale

Perhaps the main reason for introducing the semantics-pragmatics distinction is to provide a framework for explaining the variety of ways in which what a speaker conveys can fail to be fully determined by the (conventional) linguistic meaning of the sentence he utters:

- indexicality
- ambiguity
- vagueness (and open texture)
- semantic underdetermination
- implicitness
- implicature
- nonliteralness
- non-truth-conditional content
- illocutionary force

The null hypothesis is that there is always some pragmatic explanation for how, in any given case, sentence meaning can underdetermine what the speaker means. For example, the null hypothesis about controversial claims of ambiguity (on tests for ambiguity see (Atlas, 1989, Chapter 2)) is that diverse uses of an expression are best explained not by different pieces of linguistic information (several conventional meanings) but by one piece of linguistic information combined with extralinguistic information. As Green has written,

The possibility of accounting for meaning properties and syntactic distributions of uses of linguistic expressions in terms of conversational inferences rather than semantic entailments or grammatical ill-formedness was welcomed by many linguists as a means of avoiding redundant analyses on the one hand and analyses which postulate rampant ambiguity on the other. (Green, 1989, p. 106)

However, it is merely the null hypothesis that a given linguistic phenomenon has a pragmatic explanation. Particular phenomena and specific constructions obviously have to be assessed on a case-by-case basis.

Another reason for invoking the semantics-pragmatics distinction is to shed light on a number of other distinctions:

- type vs. token
- sentence vs. utterance
- meaning vs. use
- context-invariant vs. context-sensitive meaning
- linguistic vs. speaker's meaning
- literal vs. nonliteral use
- saying vs. implying
- content vs. force

Contrary to many of the formulations that have appeared since Morris's initial formulation in 1938 (see Appendix), the semantics-pragmatics distinction does not coincide with any of these other distinctions. Even so, it should respect them.

Properly formulated, it should take into account the wide range of items that have been described as semantic or pragmatic or both:

- phenomena: ambiguities, implications, presuppositions
- anomalies: paradoxes, contradictions, nonsense
- meanings: contents, interpretations
- knowledge: information, intuitions, processes
- rules and principles
- explanations

It would require a detailed lexicographic analysis of the terms 'semantic' and 'pragmatic' to do full justice to their various applications. However, these should be kept in mind in the following discussion, which will emphasize the semantics-pragmatics distinction as it reflects the difference between linguistic and extralinguistic information available to language users.

Three disclaimers: (1) I will not use the term 'pragmatics' so broadly as to apply to the full range of phenomena falling under the heading of language use. That would take us too far afield, into such areas as social psychology, sociolinguistics, cultural anthropology, and rhetoric. I will restrict the discussion to those aspects of use that are directly related to acts of communication, and not even include perlocutionary acts and collateral speech acts (Bach and Harnish, 1979, pp. 81–103). For it is in the context of communication that the question arises of where to draw the line between semantics and pragmatics. (2) Unless otherwise indicated, I will be treating sentences as the primary linguistic unit with respect to which the semantics-pragmatics distinction applies. This does not do justice to the fact that phrases can often be used as complete utterances nor to the alleged fact that there are certain intersentential semantic phenomena (for examples see Prince, 1988). (3) I am not assuming any particular framework for semantics, formal or otherwise. I do assume that the meaning of a sentence depends entirely on the meanings of

its constituents and its syntactic structure, but I am taking no position on whether sentence semantics should rely on the notion of truth conditions or propositions (however conceived). I will speak indifferently of a sentence's truth condition, its truth-conditional content, and the proposition it expresses.

2. Philosophical background

The semantics-pragmatics distinction has long been methodologically important in both linguistics and philosophy. It was implicit in philosophy a half century ago in discussions of pragmatic paradoxes and contextual implication (for a survey see Hungerland, 1960), a forerunner of Grice's notion of conversational implicature. It has often been invoked for corrective purposes. It was invoked by Strawson (1950), albeit implicitly, when he argued that Russell in his theory of descriptions had confused (linguistic) meaning and reference. Reference, Strawson contended, is something that speakers do, not words. Here Strawson anticipated the distinction between linguistic meaning and speaker's meaning, which, along with the related distinction between what is said and what is implicated, became widely influential as the result of the work of Grice (collected in Grice, 1989). Ironically, it was also Strawson (1952) who proposed a semantic account of presupposition. This was thought to make further trouble for Russell until presupposition came to be seen as a pragmatic phenomenon (Stalnaker, 1974; Grice, 1989, Chapter 17). Treating it as semantic led linguists down a blind alley for many years, searching for a solution to the "projection problem", a problem that does not arise when presupposition is seen as pragmatic.

In the sixties, invoking the semantics-pragmatics distinction enabled philosophers to stem the excesses of ordinary language philosophy practiced by Austin and his followers. Their "linguistic botanizing" and rampant appeals to "what we would say" were overly ambitious in their attempt to get philosophical mileage out of subtle features of ordinary usage. Later Austin implicitly acknowledged the semantics-pragmatics distinction by contrasting locutionary and illocutionary acts (1960, pp. 93–101). Grice (1989, Chapter 15), by applying the notion of conversational implicature and wielding his "modified" Occam's Razor, and Searle (1969, Chapter 6), with his exposure of the "assertion" and the "speech act" fallacies, challenged proposed analyses of various epistemological, logical, and ethical terms, such as 'looks', 'knows', 'or', and 'good'. Philosophers' extravagant claims of semantic ambiguity were later decried by Kripke as "the lazy man's approach in philosophy" (Kripke, 1977, p. 268). Kripke illustrated how to avoid this by invoking the distinction between semantic reference and speaker's reference to show that the difference between referential and attributive uses of definite descriptions, which had been thought to undermine Russell's theory of descriptions, is merely pragmatic (see also Bach, 1987a, Chapters 5 and 6; Neale, 1990). Philosophers have since made similar moves on other important topics:

- contrastive explanations
- counterfactual conditionals
- domains of discourse
- illocutionary standardization
- implicature
- indefinite descriptions
- logical form
- presupposition
- propositional attitude ascriptions
- relative terms
- speech act modifiers

3. Linguistic background

In linguistics the category of pragmatics has served mainly as a bin for disposing of phenomena that would otherwise be the business of semantics (as part of grammar) to explain. Relegating such phenomena to pragmatics freed linguistic theory, already becoming more and more complex, of numerous additional complications. A notable exception to this strategy was the systematic attempt by generative semanticists, in their campaign to undermine the autonomy of syntax, to empty the “pragmatic wastebasket”, so-called by Bar-Hillel, who wisely advised linguists “to first bring some order into the contents of this wastebasket” (1971, p. 401). Many defied his advice and included everything but the kitchen sink in semantics. The performative hypothesis was the most prominent example (for a brief history see Sadock, 1988). Historically, generative semantics is best remembered for generating the “linguistics wars” which have been chronicled in detail by Harris (1993).

In a more positive vein, the distinction between semantics and pragmatics has served to separate strictly linguistic facts about utterances from those that involve the actions, intentions, and inferences of language users (speaker–hearers). However, there are some linguistic phenomena that seem to straddle the semantics-pragmatics boundary:

- adjectival modification
- ambiguity vs. polysemy
- anaphora
- compounds and noun-noun pairs
- interpreting quantificational phrases
- nominalizations

And there are many linguistic phenomena which might seem at first glance to be pragmatic but, because of their syntactic basis, are arguably semantic. Space limitations prevent detailed discussion, but here are a few examples:

- constraints on anaphoric reference (c-command violations)
- empty categories

- implicit arguments
- implicit quantification over events
- thematic roles and complementation
- lexical alternations
- factive verbs
- negative polarity items
- connotations
- it-clefts, wh-clefts, preposing, inversion, topicalization and other devices of information packaging
- discourse modifiers and speech act adverbials

Most of these are syntactico-semantic phenomena that seem to explain certain co-occurrence and interpretational regularities. For example, implicit quantification over events helps explain the semantics of verbs, tense, and aspect, and the roles of adverbs (for a detailed account see Parsons, 1990). The last four items on the list above involve semantic properties concerning use, not truth conditions. These properties are not pragmatic just because they pertain to use, for they are linguistically marked.

4. Formulations

The semantics-pragmatics distinction has been formulated in various ways, generally without recognition that the different versions do not coincide. Historically, formulations have fallen into three main types, depending on which other distinction the semantics-pragmatics distinction was thought to coincide with:

- linguistic (conventional) meaning vs. use
- truth-conditional vs. non-truth-conditional meaning
- context independence vs. context dependence

The Appendix collects a variety of formulations that rely on one or another of these distinctions. Here we will briefly review the three types and identify their shortcomings.

For purposes of clarifying the semantics-pragmatics distinction, the distinction between (linguistic) meaning and use is misleading at best. It neglects the case of expressions whose literal meaning is related to use. In addition to the obvious fact that features of illocutionary force can be linguistically encoded, notably by mood (Harnish, 1994), there is the interesting case of expressions that are used to perform second-order or what Grice called “noncentral” speech acts (1989, p. 122). These are acts of commenting on the force, the point, or the role in the discourse of one’s utterance. Grice’s examples were limited to adverbs like ‘however’ and ‘moreover’, but the list may be easily expanded to include such speech act adverbials as:

after all, anyway, at any rate, besides, be that as it may, by the way, first of all, finally, frankly, furthermore, if you want my opinion, in conclusion, indeed, in

other words, now that you mention it, on the other hand, otherwise, speaking for myself, strictly speaking, to begin with, to oversimplify, to put it mildly.

With these it seems that the only way to specify their semantic contribution (when they occur initially or are otherwise set off) is to specify how they are to be used (see Bach, 1994a, pp. 148–149). Note that performatives do *not* fall in this category (Bach and Harnish, 1979, Chapter 10, 1992).

Speech act adverbials also illustrate that an expression's semantics can consist in non-truth-conditional meaning. Semantic presupposition would illustrate this too if there were such a thing, but Stalnaker (1974) and Grice (1989, Chapter 17) have made compelling cases that there is not. Even so, it may be granted that those linguistic devices, such as *it*-clefts and *wh*-clefts, which have been thought to encode semantic presupposition, do have some non-truth-conditional function. Like such devices as proposing, inversion, and topicalization, they serve to organize the presentation of information and to redirect focus.

Another example of non-truth-conditional meaning is provided by directly referential expressions, such as indexicals and demonstratives. As Kaplan (1989) has pointed out, if I say, "You are here", it is not part of the truth condition of what I say that I am speaking to you at a certain place. The truth-conditional content of this sentence, relative to the context, is that the person being spoken to is where the speaker is, but this is a singular proposition involving that person and that place. It would be true even if the speaker were silent or not even there. What Kaplan calls the "character" of the terms 'you' and 'here' determines their contribution to the content (relative to the context) of the sentence being uttered, but character is not part of that content.

Now the notion of context is often invoked to explain how pragmatics complements semantics. It is a platitude that a sentence's linguistic meaning generally does not determine what is said in its utterance and that the gap between linguistic meaning and what is said is filled by something called "context". The intuitive idea behind this platitude is that there are different things that a speaker can mean, even when using his words in a thoroughly literal way (even that he is speaking literally is a matter of context – there is no such thing as Katz's "null context" (1977, p. 14) but only informationally impoverished contexts). What one says in uttering the words can vary, so what fixes what one says cannot be facts about the words alone but must also include facts about the circumstances in which one is using them; those facts comprise the "context of utterance".

It turns out, however, that context plays a role in semantics as well as pragmatics. As we saw above, with indexicals and demonstratives (and tense also), in these cases it is on the semantic side of the ledger that content varies with context. So the distinction between context invariance and context dependence does not provide the basis for drawing the semantics-pragmatics distinction. Confusion on this point, at least prior to Kaplan's work, may have been caused by the use of the term 'pragmatics', by such philosophers as Bar-Hillel (1954) and Montague (1974), to

mean indexical semantics. Also, confusion has been caused by the fact that the limited notion of context relevant to the way in which the reference of terms like 'you' and 'here' is sensitive to context is rarely distinguished from the very broad notion of context that is relevant to pragmatics. Let me explain.

There are two sorts of contextual information, one much more restricted in scope and limited in role than the other. Information that plays the limited role of combining with linguistic information to determine content (in the sense of fixing it) is restricted to a short list of variables, such as the identity of the speaker and the hearer and the time and place of an utterance. Contextual information in the broad sense is anything that the hearer is to take into account to determine (in the sense of ascertain) the speaker's communicative intention. It is often said that what a speaker means "depends on context", is "determined by context" or is "a matter of context", but this is not narrow context in the semantically relevant sense discussed above. When it is said that "Context makes it clear that...", what is meant is that there are items of information that the hearer can reasonably suppose the speaker to have intended him to take into account to determine what the speaker means. In this broad, pragmatic sense, which is also relevant to whether the speech act is being performed successfully and felicitously, context does not literally determine content. So not just any sort of context variability is semantic. The variability must be provided for by lexical meaning and sentence grammar.

An important complication here is that there are many (indicative) sentences that do not express complete propositions even relative to a context. Though syntactically complete, they are semantically incomplete (Bach, 1994a, 1994b). Here are some straightforward examples (given as the grammatical member of a minimal pair):

Fred finished/*completed yesterday.

Sam ate/*devoured earlier.

Jack tried/*attempted again later.

In each case, even though the verb lacks the complement that a similar verb requires, the sentence is syntactically complete. But the sentence is not semantically complete and the hearer must infer some completing material, e.g., 'the job', 'lunch', and 'to call Jill', to understand the speaker. A pragmatic process of completion is required to arrive at a full proposition, at something with a determinate truth condition. These cases are also counterexamples to the truth-conditional conception of semantics. There is no theoretical basis for denying their semantic incompleteness by inventing hidden syntactic slots that must be filled in order for a complete proposition to be expressed. Rather, we must just acknowledge the fact that some sentences are semantically incomplete (and not just in need of semantic values, as with indexicals) and that understanding utterances of them requires pragmatic supplementation.

Then there is the case of sentences which, strictly and literally, express an unrestricted proposition but are typically used to convey something more specific:

I haven't taken a bath [today].

Nobody [important] goes there any more because it is too crowded.

Abe didn't have sex and [thereby] get infected; he got infected and [then] had sex.

It is sometimes argued that because such sentences are standardly used without the bracketed material but such material is understood anyway, this material enters into what is said by the utterance, into its explicit content (Sperber and Wilson, 1986; Recanati, 1989). However, this material is not uttered and does not correspond to anything in the syntactic structure of the uttered sentence (even as an empty category in the sense of GB theory). So it is not explicit. It is not implied by what is said but that does not make it explicit either – it is implicit in what said. Such utterances are understood by way of a pragmatic process of expansion. Expansion, like completion, is a process required for the recognition of what I call “conversational implicatures”, as opposed to Gricean implicatures (Bach, 1994a, 1994b).

We have seen that the various traditional ways of formulating the semantics-pragmatics distinction either leave something out or draw the line at the wrong place. This is similar to what Levinson (1983, pp. 3–35) concluded in his survey of actual and possible formulations, although he ended up opting for the truth-conditional conception of semantics (he did so only provisionally and for historical rather than theoretical reasons). We need a better formulation. Otherwise, we will be left with what Horn (1988, p. 114) calls the “disjunctive attitude”, supposing, if only by default, that any phenomenon that is “too ill-behaved and variable to be treated coherently within the syntactic component, . . . [not] quite arbitrary enough for the lexicon or quite phonological enough for the phonology . . . must be pragmatic”.

5. A better formulation

What we need is a formulation of the semantics-pragmatics distinction that takes the above distinctions into account but does not rely on them too heavily. It needs to accommodate the following facts, that:

- only literal contents are semantically relevant
- some expressions, as a matter of meaning, are context-sensitive
- narrow context is relevant to semantics, broad context to pragmatics
- non-truth-conditional, use-related information can be linguistically encoded
- rules for using expressions do not determine their actual use
- that a sentence is actually uttered is a pragmatic fact

These facts can all be accommodated on the supposition that semantic information pertains to linguistic expressions, whereas pragmatic information pertains to utterances and facts surrounding them. Semantic information about sentences is part of sentence grammar, and it includes information about expressions whose meanings are relevant to use rather than to truth conditions. Linguistically encoded information can pertain to how the present utterance relates to the previous, to the topic of the present utterance, or to what the speaker is doing. That there are these sorts of linguistically encoded information shows that the business of sentence semantics cannot be confined to giving the proposition it expresses. Sentences can do more than express propositions. Also, as we have seen, there are sentences which do less than express propositions, because they are semantically incomplete.

Pragmatic information concerns facts relevant to making sense of a speaker's utterance of a sentence (or other expression). The hearer thereby seeks to identify the speaker's intention in making the utterance. In effect the hearer seeks to explain the fact that the speaker said what he said, in the way he said it. Because the intention is communicative, the hearer's task of identifying it is driven partly by the assumption that the speaker intends him to do this. The speaker succeeds in communicating if the hearer identifies his intention in this way, for communicative intentions are intentions whose "fulfillment consists in their recognition" (Bach and Harnish, 1979, p. 15). Pragmatics is concerned with whatever information is relevant, over and above the linguistic properties of a sentence, to understanding its utterance.

Consider some examples involving pronouns. There is no semantic basis for interpreting the pronouns one way in

Ann told Betty that she wanted to borrow her car.

and the opposite way in

Ann told Betty that she could not borrow her car.

The hearer relies on extralinguistic information to interpret one utterance one way and the other in the opposite way. The so-called "E-type" pronoun in

Most philosophers who have written a book think it is brilliant.

is interpreted as going proxy for the description 'the book he wrote', and the "pronoun of laziness" in

John carried his luggage but everyone else checked it in.

is also interpreted descriptively – 'it' is not taken as being used to refer to John's luggage (see Bach, 1987a, pp. 258–261; Neale, 1990, pp. 180–191). In none of these cases is there any semantic requirement that the pronoun be interpreted in a certain way. The explanation for the preferred interpretation is pragmatic.

As part of linguistics and philosophy of language, pragmatics does not provide detailed explanations of how interpretation works in actual practice. This is a problem for cognitive and social psychology. For this reason it seems futile for linguists to seek a formal pragmatics. The task of explaining how utterances change context, for example, or how they exploit context, is not a job for linguistic theory by itself. The task is impossible without introducing general considerations about human reasoning and rational communication. Similarly, it is unreasonable to complain that theories like Grice's account of conversational implicature provide no algorithm for conversational inference, so that, when applied to particular cases they simply pull implicatures out of a hat (see Sperber and Wilson, 1986; Kempson, 1988; Davies, 1995). This is not just a problem for Grice's theory.

At any rate, whereas semantic information is grammatically associated with the linguistic material uttered, pragmatic information arises only in relation to the act of uttering that material. (In fact, a stony silence can impart pragmatic information and thereby communicate something.) Whereas semantic information is encoded in what is uttered, pragmatic information is generated by the act of uttering it. No sentence encodes the fact that it is being uttered. Even the sentence 'I am speaking' is not analytic. The act of producing the utterance exploits the information encoded but by its very performance creates new information. That information, combined with the information encoded, provides the basis for the hearer's identification of the speaker's communicative intention. Contextual information is relevant to the hearer's inference only insofar as it can reasonably be taken as intended to be taken into account, and that requires the supposition that the speaker is producing the utterance with the intention that it be taken into account. In contrast, the encoded information provides the input to the hearer's inference in any context.

6. Challenges

I foresee three main challenges to the semantics-pragmatics distinction, at least as it has been drawn here. They would contend that our formulation rests on one or another false assumption, (1) that semantics is autonomous from pragmatics, (2) that literal meaning is a viable notion, and (3) that communication involves Gricean reflexive intentions. In reply, I will suggest that each challenge identifies certain empirical complications for the application of the semantics-pragmatics distinction but does not undermine the distinction itself. For this reason, defending those assumptions against these challenges will help clarify the distinction.

6.1. Against semantic autonomy

Occasionally it is claimed that pragmatics somehow impinges on semantics. Consider, for example, that words are often used in creative ways that depart from

any of their conventional meanings, e.g., using nouns as verbs (Clark, 1992, Chapters 10 and 11) or cases of metonymy or deferred reference. Utterances of sentences like

Chicago always votes Democrat.

Philosophy has a tenure-track opening.

John was so thirsty he drank three mugs.

depart from their literal meanings, although people generally don't think of such uses as not quite literal. In such cases the sentence possesses no meaning other than its usual conventional meaning(s) – it just is not being used in accordance with its meaning(s).

Whereas the difference between

Josh played his favorite violin yesterday.

and

Josh played his favorite concerto yesterday.

seems to have a clearly semantic basis (in terms of the different thematic roles played by 'concerto' and 'violin'), the autonomy of semantics relative to pragmatics might be challenged on account of examples like the following:

John finished the newspaper/the letter/the meal.

Jack enjoyed the food/the movie/the day.

Jill wants a soda/a salad/a fork/a car.

What ordinarily counts as finishing a newspaper, a letter, or a meal varies from one case to another. Typically, you finish reading a newspaper, finish reading or writing a letter, and finish cooking or eating a meal. It seems to be a matter of semantics that verbs like 'start' and 'finish' are understood as having a verb (in gerundive form) in its complement, but it is a pragmatic matter which verb that is. The situation is similar with 'enjoy' and 'want' in the other examples above. Taken by themselves, these sentences are semantically incomplete in the sense described earlier. This does not mean, however, that the pragmatic processes required for understanding utterances of them somehow impinge upon their semantics. Nor is this shown, as Recanati (1989, 1995) has argued, by the fact that the completion is accomplished before the entire sentence is processed. The semantics-pragmatics distinction is concerned with the information available to the hearer, not with its real-time, online processing, which, it may be granted, is far from sequential.

Gazdar (1979, pp. 164–168) argues against the autonomy of semantics by means of examples of other sorts. One of his examples is:

To have a child and get married is worse than getting married and having a child.

Since the alternatives here are semantically equivalent, given the logical conjunction reading of ‘and’, how can we explain the force of an utterance of this sentence? Gazdar thinks that the correct pragmatic explanation has semantic import. However, as we saw earlier with a similar example, the proper pragmatic explanation appeals to the process of expansion, which has no semantic repercussions. It requires merely the supposition that the sentence is not being used with its strict, conventional meaning. On the expansion story, this follows from the fact that its utterance would normally be understood as including two implicit occurrences of the word ‘then’.

Gazdar also argues that the meaning of this permission sentence,

Inmates may smoke or drink.

is stronger than the combined meaning of the disjunction of permissions,

Inmates may smoke or inmates may drink.

and offers an account of its semantics that involves pragmatic considerations. However, this example may be disposed of in Gricean fashion. For if the utterance of ‘Inmates may smoke or drink’ is a permission, presumably it is a permission that can be complied with. The inmates can only be expected to interpret it in such a way that they can determine what they are permitted to do. If its import were either to permit smoking or to permit drinking without specifying which, there would be no way for an inmate to know how to comply with it.

6.2. Against literal meaning

In formulating the semantics-pragmatics distinction, I have made no attempt to characterize the job of semantics. But as we have seen, there is more for a semantic theory of a language to do than to give a compositional account of the truth conditions of or the proposition expressed by each sentence, as a function of its syntactic structure and the semantic values of its constituents. But it would seem that the semantics-pragmatics distinction as formulated presupposes a well-defined level of lexical semantics and a viable distinction between literal and nonliteral meaning. There are several possible reasons for doubting that there is such a level.

I am not referring here to general skepticism about linguistic meaning, based on behaviorism about language use. Nor am I referring to doubts about linguistic meaning based on the familiar observation that most words are impossible to

define, at least in terms of singly necessary and jointly sufficient conditions of application, and are vague or open-textured. These platitudes show not that Wittgenstein and Quine were right about linguistic meaning but only that it is not what philosophers used to think it to be. The two arguments I want to consider claim that the notion of literal meaning required by the semantics-pragmatics distinction cannot do justice to the general context-dependence of language.

One such argument is based on polysemy, as exemplified by the adjectives 'sad', 'long', and 'dangerous' as they occur in the following phrases:

sad person/sad face/sad day/sad music

long stick/long movie/long book

dangerous drug/dangerous game/dangerous road

The import of these adjectives varies with the noun they modify, but they do not seem to be cases of ambiguity, of linguistic coincidence (or else they would not have similarly-behaving counterparts in other languages). The argument is that since this variation in import is not due to ambiguity, it must have a pragmatic explanation. However, there is an alternative possibility, namely that polysemy involves what Pustejovsky (1995) calls "co-compositionality": what varies from case to case is not a term's semantic properties but how those properties interact with those of the term it is in construction with. I do not endorse Pustejovsky's ambitious theory of how this works, but certainly it is an improvement over what he calls "sense enumeration lexicons" (1995, p. 29). The relevant point here is that the phenomenon seems too systematic to be relegated to pragmatics. It does not justify the claim that pragmatics impinges on semantics.

The other argument relies on the observation that natural language is context-sensitive through and through. Contrary to the Gricean picture, it is argued, understanding an utterance is not just a matter of knowing the conventional meaning of what is uttered and, as necessary, resolving ambiguities, determining references, and distinguishing what is implicated from what is said. From this it is inferred that, even leaving aside disambiguation and reference fixing, there is often a pragmatic element in what is said, which, therefore, is not determined by the semantics of what is uttered. The general context-dependence of "interpretations" of utterances is supposed to show that what is said is not a purely semantic matter (Kempson, 1988; Recanati, 1989, 1996).

The trouble with these arguments is that they run roughshod over a number of straightforward distinctions. Ignoring Austin's distinction between locutionary and illocutionary acts (1960, pp. 92–101), they fail to distinguish what is said from what is stated. They fail to distinguish what is said, in the strict and literal sense tied to the syntactic form of the sentence, with what is directly communicated in uttering the sentence, which may include elements that are not associated with anything in the sentence. They fail to distinguish context in the narrow sense described earlier, which is relevant to the interpretation of the sentence uttered, from

context in the broad sense, which is relevant to the interpretation of its utterance, i.e., to identifying the speaker's overall communicative intention.

It is trivially true that in the broad sense of context every utterance is context-sensitive. After all, it is never part of the meaning of a sentence that on a particular occasion of use it is being used to communicate. That is something the hearer presumes from the fact that the speaker is uttering the sentence. This "communicative presumption", as Bach and Harnish (1979, p. 7) call it, comes into play even if what the speaker means does not extend beyond or depart in any way from the meaning of the sentence he utters. For it is never part of what a sentence encodes that it has to be used literally – the hearer must infer (even if only by default) that it is being used literally. The utterance does not carry its literalness on its sleeve. It might contain the word 'literally', but even that word can be used nonliterally.

6.3. Against Gricean intentions

Our formulation of the semantics-pragmatics distinction relies heavily on a Gricean conception of communicative intentions, for it takes as key to the pragmatic side the idea that in any communication situation extralinguistic information comes into play because, and only because, such information is intended, or taken by the hearer as intended, to be taken into account. So another way of challenging our formulation of the semantics-pragmatics distinction would be to challenge the Gricean view of communication.

Such a challenge has been mounted by Sperber and Wilson (1986) with their so-called relevance theory (in relevance theory 'relevance' does not mean relevance). The "principle of relevance" states that, as a matter of general cognitive fact, people seek to maximize contextual effects at a minimum of processing cost. Apart from not explaining how to measure contextual effects and processing costs, how to make them commensurate with each other, or why there is always a unique way satisfying the principle (Bach and Harnish, 1987), relevance theory ignores the fundamental fact that the hearer is to recognize the speaker's intention partly on the basis that he is so intended. Instead, relevance theory seems to assume that in the context of communication everyone is an applied relevance theorist. That is, people are supposed to gear their utterances to their listeners' inherent propensity to discover maximal contextual effects at a minimum of processing cost.

Contrary to Sperber and Wilson's complaint that Grice's account requires the hearer to know what the speaker's intention is in order to identify it (1986, pp. 28–31 and 256–257), there is nothing paradoxical about the reflexivity of communicative intentions (Bach, 1987b). For all that this reflexivity involves is that the hearer is to take into account the fact that he is intended to identify the speaker's intention, whatever that intention is. That is, the hearer may presume that the speaker's intention is identifiable under the circumstances. This leaves open, of course, the question of how the hearer, even when armed with that presumption, manages to figure

out the speaker's intention. The basic shortcoming of relevance theory is that it provides no place for this presumption. It replaces the distinctive feature of rational communication with an *a priori* generalization about human cognitive processes.

Relevance theory does not do justice to the fact that whereas semantic information is associated with the sentence uttered, pragmatic information is tied to the fact that the speaker is uttering it. Any contextual information, whether about the immediate situation (including what has been said previously), the conversants' relationship, or their background knowledge, is relevant (in the ordinary sense of 'relevant') to the interpretation of the utterance only because it is intended, or can reasonably be taken as intended, to be taken into account. That is why, for example, the pragmatic paradoxes philosophers discussed a half century ago arise only because the speaker actually utters the seemingly paradoxical sentence, e.g.,

It is raining but I don't believe it.

I am not speaking.

I am lying.

This fact was also essential to the notion of contextual implication that predated Grice's notion of conversational implicature. It is essential to understanding why presupposition is a pragmatic phenomenon, something done by speakers not by their words, and why implicatures "are carried not by what is said but only by the saying of what is said, or by 'putting it that way'" (Grice, 1989, p. 39).

7. Conclusion: Benefits

There is nothing new in our formulation of the semantics-pragmatics distinction. It relies on the familiar distinctions between sentences and utterances and between linguistic (grammatical) and extralinguistic information. What is new, if anything, is the way in which it accommodates various other distinctions without attempting to reduce the semantics-pragmatics distinction to any of these. The present formulation has aimed to:

1. simplify the task of semantic theory by identifying a principled reason which, when applicable, justifies not addressing certain phenomena that might otherwise seem the business of semantics to explain,
2. keep open the option that certain seemingly pragmatic phenomena might be correlated with or constrained by syntactic features in such a way as to merit classification as semantic,
3. avoid burdening semantics with the false assumption that every (indicative) sentence expresses a proposition (even relative to a context) and does nothing else,
4. accommodate the fact that contextual parameters and speech act information can be linguistically encoded, but without equating context in the broad sense

relevant to communication with context in the narrow sense relevant to providing values for the contextual parameters that determine or at least constrain the reference of indexicals,

5. respect intuitions about what is and what is not semantic without always accepting them at face value (sometimes intuitions are better accounted for not by explaining them but by explaining them away), and

6. justify and preserve the distinction between interpretation of a sentence and interpretation of an utterance and thereby the distinction between narrow linguistic competence and general communicative rationality.

These broad features of our account do not determine on which side of the semantics-pragmatics boundary particular linguistic phenomena fall. Whether a given phenomenon has a semantic or a pragmatic explanation or, as is often the case, some combination of both, must be settled on a case-by-case basis. Obviously it is one thing to formulate the semantics-pragmatics distinction and another thing to apply it.

Appendix: A chronology of formulations

Morris (1938/1971):

Semantics deals with the relation of signs to ...objects which they may or do denote. Pragmatics concerns the relation of signs to their interpreters. (pp. 35, 43)

Stalnaker (1972):

Syntax studies sentences, semantics studies propositions. Pragmatics is the study of linguistic acts and the contexts in which they are performed. There are two major types of problems to be solved within pragmatics: first, to define interesting types of speech acts and speech products; second, to characterize the features of the speech context which help determine which proposition is expressed by a given sentence. ... It is a semantic problem to specify the rules for matching up sentences of a natural language with the propositions that they express. In most cases, however, the rules will not match sentences directly with propositions, but will match sentences with propositions relative to features of the context in which the sentence is used. These contextual features are part of the subject matter of pragmatics. (p. 383)

Katz (1977):

[I] draw the theoretical line between semantic interpretation and pragmatic interpretation by taking the semantic component to properly represent only those aspects of the meaning of the sentence that an ideal speaker-hearer of the language would know in an anonymous letter situation, ... [where there is] no clue

whatever about the motive, circumstances of transmission, or any other factor relevant to understanding the sentence on the basis of its context of utterance. (p. 14)

Gazdar (1979):

PRAGMATICS = MEANING – TRUTH CONDITIONS (p. 2)

What we need in addition is some function that tells us about the meaning of utterances. . . . The domain of this pragmatic function is the set of utterances, which are pairs of sentences and contexts, so that for each utterance, our function will return as a value a new context – the context as changed by the sentence uttered And we can treat the meaning of the utterance as the difference between the original context and the context arrived at by utterance of the sentence. [This applies to only] a restricted subset of pragmatic aspects of meaning. (pp. 4–5)

Kempson (1988):

Semantics provides a complete account of sentence meaning for the language, [by] recursively specifying the truth conditions of the sentences of the language. . . . Pragmatics provides an account of how sentences are used in utterances to convey information in context. (p. 139)

The Oxford Companion to Philosophy (Fotion, 1995):

Pragmatics is the study of language which focuses attention on the users and the context of language use rather than on reference, truth, or grammar. (p. 709)

The Cambridge Dictionary of Philosophy (Lycan, 1995):

Pragmatics studies the use of language in context, and the context-dependence of various aspects of linguistic interpretation. . . . [Its branches include the theory of how] one and the same sentence can express different meanings or propositions from context to context, owing to ambiguity or indexicality or both, . . . speech act theory, and the theory of conversational implicature. (p. 588)

The Blackwell Companion to Philosophy (Davies, 1995):

The distinction between semantics and pragmatics is, roughly, the distinction between the significance conventionally or literally attached to words, and thence to whole sentences, and the further significance that can be worked out, by more general principles, using contextual information. (p. 124)

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CHAPTER 4

The Semantics/Pragmatics Distinction: A View from Relevance Theory*

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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1. Orientation

Many different enterprises go under the title of semantics or semantic theory. For each of these, there must be a correspondingly different conception of pragmatics, at least in those cases where such a distinction is admitted. On the relevance-theoretic view, which is the primary focus of this paper, the distinction between semantics and pragmatics is a distinction between two types of cognitive process employed in understanding utterances: decoding and inference. The decoding process is performed by an autonomous linguistic system, the parser or language perception module. Having identified a particular acoustic stimulus as linguistic, this system executes a series of deterministic grammatical computations, or mappings, resulting in an output representation, which is the semantic representation, or logical form, of the sentence or phrase employed in the utterance. It is a structured string of concepts, which has both logical and causal properties. The second type of cognitive process, the pragmatic inferential process, integrates the linguistic contribution with other readily accessible information in order to reach a confirmed interpretive hypothesis concerning the speaker's informative intention. This inferential phase of interpretation is constrained and guided by the communicative principle of relevance, which licenses a hearer to look for an interpretation which interacts fruitfully with his cognitive system and does not put him to any unjustifiable processing effort.

The decoded 'semantic' representation is seldom, if ever, fully propositional; it functions merely as a kind of template or assumption schema, which necessarily requires pragmatic inference to develop it into the proposition the speaker intended to express. This is what is known as semantic underdeterminacy: the language code drastically underdetermines the explicitly communicated propositional content of the utterance (hence its truth conditions). The derivation of the proposition explicitly communicated is dependent on pragmatic inference, not merely in determining intended referents and intended senses of ambiguous expressions, but in supplying unarticulated constituents and adjusting encoded conceptual content (enriching and/or loosening it). Clearly, the concept of 'semantics' at issue in the semantics/pragmatics distinction as construed here, is not to be equated with truth conditions. According to this picture, a truth-conditional semantics cannot be given directly to natural language sentences but should take fully propositional thoughts as its proper domain.

From these brief statements, to be elaborated in Section 3, it is clear that relevance theory is to be located squarely within a cognitive scientific framework, a framework which adopts a representational and computational view of the mind. Comparisons with other views of the semantics/pragmatics distinction, often of a more philosophical nature, are not straightforward, though instructive. This is particularly true of Grice's distinction, within utterance meaning, between what is said and what is implicated. Although his exposition of a system of conversational maxims provided the starting point and impetus for inferential pragmatics, the dif-

ferences between his outlook and the cognitive pragmatics of relevance theory are striking. In the next section, I give a short (and necessarily incomplete) survey of ways in which the semantics/pragmatics distinction has been construed.

2. Some semantics/pragmatics distinctions

2.1. Formal semantics and pragmatics

At one extreme in the wide gamut of conceptions of semantics is the formal logical approach. A language is viewed as an object consisting of a set of well-formed formulas which are evaluated for truth on the basis of the semantic values (individuals, sets) assigned to their primitives and the relationships among them imposed by the syntactic rules employed in generating the formulas. The very same formal methods employed in giving the semantics of artificial logical languages (Carnap's *pure semantics*) are applied to the semantics of natural language, without any intermediate entities, such as contents, intensions, meanings, propositions, thoughts, or even translations into a logical language, mediating the relation between linguistic forms and extensions. These are the methods of Tarski and of Montague in his 'English as a formal language': "ExFx" is true (in a model) iff the set of things that are F (in the model) is nonempty', "Something is white" is true (in a model) iff the set of white things (in the model) is nonempty'.

Natural-language semantics, like logical semantics, is context-invariant. Natural language, however, unlike standard logical languages, is riddled with indexicals, whose reference cannot be determined without knowledge of context. So if the formal approach was to include in its domain something approximating the full range of the sentences of the language, some concept of context of use had to be brought into the account. Montague (1968) did just this and, following a suggestion of Bar-Hillel (1954), labeled the development 'pragmatics'; pragmatics is the formal analysis of indexical expressions, because that analysis involves essential reference to the context of use of an expression. So tensed sentences are evaluated for truth in a model relative to a time, and tensed sentences containing the first person pronoun are evaluated for truth in a model relative to a time and an individual designated as speaker, and so on, there being no obvious limit to the contextual elements (or coordinates) that would need to be, and could be, included. This is, of course, still a context-invariant specification; one and the same truth-evaluation statement for a given sentence holds across all particular contexts. In this species of 'pragmatics', there is no hint of a pragmatic principle, a conversational maxim, or any assumptions about communicative behaviour; such entities as conversational implicatures lie way outside the concerns of this truth-conditional, model-theoretic approach to natural language sentences. Montague would have taken these to belong to some quite other type of theory, utterance theory or communication theory, some psycho-social enterprise, remote from his formal logical interests.

As Kalish (1967) says of Montague's work on indexical languages: "Pragmatics, so conceived, is simply the extension of the semantical truth-definition to formal languages containing indexical terms – a conception easy to reconcile with C.W. Morris' classification,¹ for the truth-value of a sentence with an indexical term seems to be related to both the person asserting the sentence and his space-time position." That is, this is the pure pragmatic counterpart to pure semantics. This particular version of the semantics/pragmatics distinction is not now in much currency. Lewis (1972), who is very much in the formalist tradition, included a set of contextual coordinates (possible world, speaker, addressee, time, place, contextually salient entities, etc.) within his semantics, calling it indexical semantics, and this is now general practice among formalists.² Indexical linguistic forms have a fixed semantics, though giving that semantics requires that reference be made to abstract contextual elements.

Interestingly, the idea that there are intrinsically 'pragmatic' lexical items and syntactic structures in natural language surfaces in other, more psychologically oriented, non-formal approaches. The lexical items thought of in this way are those whose linguistic meaning does not directly contribute a constituent to the representation which enters into the process of evaluating a sentence/utterance for truth, but which specifies a rule for use, words whose role is to anchor the truth-conditional elements of the sentence in some way to the act of utterance. These may include indexicals, but, more obviously, speech act indicators, and so-called discourse connectives, markers, and particles, some of which are discussed in Section 5, under the title of 'procedural semantics'. The syntactic structures whose 'meaning' is conceived of as pragmatic are those which differ transformationally from the canonical declarative sentence type but without making any difference to truth conditions; examples include the various cleft structures and those which involve extraposed or preposed constituents. These are considered briefly in the next section.

2.2. *Internalist semantics and pragmatics*

At the opposite pole to the formalist as characterized above, is the sort of individualist, internalist approach to language, according to which it is not a set of sentences (mind-external well-formed formulas) that are taken to be the object of linguistic study, but the cognitive computational structures which constitute a native speaker's tacit knowledge of her language (her idiolectal competence). These

¹ As is well known, Morris (1938) distinguished between, on the one hand, the relations of referring, denoting, and meaning that hold between symbols and things that are not symbols, and, on the other hand, the relations of being used, uttered, and responded to that hold between symbols and things that are not symbols; the first, he called semantics, the second pragmatics.

² For useful discussion of Montague's model-theoretic account of indexical languages and of the semantic/pragmatic terminological issues mentioned here, see (Dowty, Wall and Peters, 1981, pp. 131–139).

constitute but one, though an essential, component of her ability to produce and comprehend an infinite range of utterances of both sentential and subsentential linguistic forms. The investigation of this I-language (contrasted with the E(xternal)-language focus above) issues in a system of interacting computational principles which define levels of representation, phonological, syntactic and, in some sense of the word, semantic. Chomsky (1992, pp. 212, 218) talks of an “internalist semantics” and cites Higginbotham (1989)’s work, in which a representational level featuring a Davidsonian event variable plays a central role (Davidson, 1967). For instance, the mental representation which captures a native speaker’s knowledge of the meaning of the sentence in (1a) is that given in (1b), where the lexical entry for the verb ‘walk’ includes the semantic information that the verb expresses a relation *walk*(*x*, *e*), which applies to a thing and an event if the event is an event of walking by that thing:

- (1) (a) John walks slowly.
 (b) Ee (*walk*(*j*, *e*) & *slow*(*e*))

As Higginbotham (1995, pp. 9–13) points out, one of the advantages of this sort of representation is the transparency of the logical entailments ‘John walks’ and ‘Something slow takes place’, knowledge of which is plausibly viewed as part of our linguistic semantic competence.³

This is, of course, all firmly lodged within the head (the mind/brain); it is part of a system of mappings, which mediate between an impinging phonetic-acoustic stimulus and a meaning or understanding, which can interact with other meanings or understandings within the cognitive system of the receiver. The world outside the head does not enter into the account, except in so far as it is represented in the head; there are no extensions, no arbitrary models. Some would say there is no semantics here, that since this is merely a translation from one representation to another, all the real work of semantics remains to be done; that is, the work of explicating the alleged ‘central semantic fact about language, . . . that it carries information about the world’ and that sentences of a language ‘make claims about the world’ (Soames, 1989, p. 575). Chomsky himself is uneasy with the term ‘semantics’ used in an internalist way, and suggests that the I-semantic representation should properly be viewed as another syntactic level; it is some notion of a logical

³ These few remarks do not begin to do justice to the range of illuminating analyses enabled by the idea that the semantics of verbs involves a position for events. For instance, the source of the ambiguity of English *float under the bridge* (modifiable by either of the prepositional phrases *in an hour* or *for an hour*), an ambiguity not present for French or Korean, is explained in terms of (a) the semantics of the verb *float* including an event argument, and (b) *under* in the sense of ‘go under’ being a predicate with two event arguments, one of which is in fact modified by *float* (to float under the bridge, in this sense, is, in effect, to go under the bridge floatingly). See Higginbotham (1995) for the full details of this analysis and for the application of event variables in explaining a range of complex (language-variable) sequence-of-tense phenomena.

form, either his LF or a further syntactic object computed from it, the syntactic level which interfaces with the internal conceptual system.

However, Chomsky is also skeptical about the possibility of an externalist, referential semantics, which relies, as he puts it, on 'alleged relations between words and external things', relations like 'denotation', 'true of', etc. Certain scientific and technical terms do, perhaps, have a real world denotatum, terms like 'H₂O', 'protein', 'acid', 'I-language', introduced (non-naturally) within a particular theory, constructed to explain some real world phenomena. Ordinary (naturally arising) language terms, on the other hand, like 'water', 'home', 'London', 'Chinese' do not; their 'semantic' properties provide quite specialized perspectives from which to view the outside world, crucially involving human interests and concerns. For instance, whether something is water or not is not an objective matter, but is interest-relative: "Suppose cup₁ is filled from the tap. It is a cup of water, but if a tea bag is dipped into it, that is no longer the case. It is now a cup of tea, something different. Suppose cup₂ is filled from a tap connected to a reservoir in which tea has been dumped (say, as a new kind of purifier). What is in cup₂ is water, not tea, even if a chemist could not distinguish it from the present contents of cup₁. The cups contain the same thing from one point of view, different things from another; but in either case cup₂ contains only water and cup₁ only tea. . ." (Chomsky, 1995, p. 22). After discussing the subtleties of a range of other similarly basic cases, he concludes: "... the argument for a reference-based semantics (apart from an internalist syntactic version) seems to me weak. It is possible that natural language has only syntax and pragmatics. . ." (Chomsky, 1995, p. 26).

Fodor, on the other hand, does believe in a referential semantics (see Fodor, 1987); in fact, he believes it is the only sort of semantics there is, standing with Chomsky on the view that all internalist representation is syntax. This referential semantics, though, is not a semantics of natural language expressions: "English *has no semantics*. Learning English isn't learning a theory about what its sentences mean, it's learning how to associate its sentences with the corresponding thoughts. To know English is to know, for example, that the form of words, 'there are cats' is standardly used to express the thought that there are cats; and that the form of words 'it's raining' is standardly used to express the thought that it's raining;" (Fodor (1998, p. 9), emphasis in the original). It is the language of thought that has a referential semantics, and that semantics gives the contents of our propositional attitudes (beliefs, desires, intentions, etc.); natural language sentences can, at most, be thought of as inheriting this semantics from the beliefs, desires, etc. that it is used to express. Apart from Fodor's simplifying assumption that natural language sentences are isomorphic with the thoughts they express, this view is consonant with the relevance-theoretic outlook: intentionality resides primarily in thought and that is the appropriate domain for an externalist truth-conditional semantics.

I leave aside now the issue of whether there is a 'real' externalist semantics to be given for natural language, or for thought, and turn instead to consideration of the conception of pragmatics that accompanies the internalist view. The first point

to be clear about is that the domain labeled pragmatics by the formalists discussed above, is not pragmatics on the internalist story. Although the sort of internalist semantics outlined here appears to be like the formalist view in that it takes natural language semantics to be context-independent, it doesn't follow from this that in giving the semantics of a word or sentence no reference may be made to the notion of context or to roles like speaker, hearer, etc. Native speakers know (and know in a context-free or context-general sort of a way) that the pronoun *I* involves a reference to the speaker and that the pronoun *she* involves a reference to a salient female in the context; this is the inherent, stable meaning of these linguistic forms, so this is part of their semantics. Higginbotham (1988), following Burge (1974), employs a system of conditional normal forms to capture native speakers' knowledge of the meaning of sentences with indexicals and demonstratives. The consequent of the conditional gives the truth conditions (in standard T-sentence format) of utterances of sentences with a given structure, assuming that the antecedents are fulfilled. For instance, what a speaker knows when she knows the meaning of the sentences in (2a) and (3a) is represented by (2b) and (3b), respectively, which are instances of the general scheme for giving the truth conditions of context-dependent utterances, shown in (4):

- (2) (a) She is lazy.
 - (b) If x is referred to by *she* in the course of an utterance of (2a) and x is female, then that utterance is true just in case $\text{lazy}(x)$.
 - (3) (a) That is green.
 - (b) If x is referred to by *that* in the course of an utterance of (3a), then that utterance is true just in case $\text{green}(x)$.
 - (4) If u is an utterance of S, such that the speaker refers with her utterance of A to x , then that utterance is true just in case $P(x)$.
- (Higginbotham, 1988, 1995)

In effect, what is going on here is that the T-sentence is made conditional on certain types of contextual parameters obtaining; these parameters are, of course, entirely abstracted from the specifics of particular contexts. Higginbotham (1988, p. 40) expresses the hope that this approach promotes semantic theory "without leading into the morass of communicative context".⁴ The information that may be brought to bear from general knowledge, or from immediate perception, in the interpretation

⁴ This is a truth-conditional view of semantics, but it is a psychologised version, it is native speakers' knowledge of the truth-conditional properties of their language/dialect and, as such, has a quite different ontological status from the formal model-theoretic approach, alluded to in the previous section. It is constrained in ways that that approach is not, most notably in that it must capture that interpretation which the I-language in fact has, rather than theorizing across possible interpretations (= models) for a syntactic system. For discussion of the model-theoretic approach and its applicability to natural language, see Lepore (1983) and Higginbotham (1988, pp. 40–46).

of a particular utterance of a natural language sentence, has no bearing whatsoever on its semantics.

So what is an internalist pragmatics about? According to Chomsky, in one of his few statements bearing on this issue, pragmatic competence is a component of the mental state of 'knowing a language'; he distinguishes the following: (a) *grammatical competence*: the computational aspects of language, that constitute knowledge of form and meaning, and (b) *pragmatic competence*: knowledge of the conditions for appropriate use, of how to use grammatical and conceptual resources to achieve certain ends or purposes (Chomsky, 1980, pp. 59, 224–225). The semantics/pragmatics distinction here is a distinction between two different types of knowledge about language: on the one hand, knowledge of meanings of lexical items and of LF structures, and, on the other hand, knowledge of how to employ those structures, including, one assumes, in communication.

One of the few people to pursue this view of pragmatics as a competence system, a body of knowledge about language, is Kasher (1991a, 1991b, 1991c, 1994). However, the upshot of his categorization of pragmatic knowledge into different types is that only one rather small component, that of 'knowledge of basic speech act types, e.g., assertion, question, command' is included in the domain of knowledge of language. The various other components appear not to be linguistic at all; for instance, knowledge of non-basic speech act types, such as apologizing, congratulating, admitting, is taken to be part of general knowledge, and the application of general cognitive principles in the *generation* (as he puts it) of conversational implicatures, indirectness, aspects of style, and politeness, is also located in the domain-neutral central systems responsible for integrating information from a range of sources, perceptual, linguistic and conceptual. This raises the issue of whether an internalist pragmatics should be, or even can be, conceived of as intrinsically linguistic, rather than as interpretive in some wider sense, and strongly suggests a negative answer.

The second issue that arises is whether an internalist pragmatics can be, and should be, conceived of as a cognitive competence (a body of tacit knowledge), rather than as a performance system, which calls on knowledge systems, including linguistic competence. It is notable that despite his intention to incorporate pragmatics within the Chomskyan research programme, Kasher ends up distinguishing different types of pragmatics in terms of Fodorian modular input systems and nonmodular central systems (Fodor, 1983). For instance, he posits a 'principle of effective means' which says "Given a desired end, one is to choose that action which most effectively, and at least cost, attains that end, *ceteris paribus*" (Kasher, 1982, p. 32; 1991c, p. 577); this is a general pragmatic principle that governs all rational intentional action, including, as one case, acts of speaking. It is not fundamentally linguistic and, rather than a representation of knowledge, it is a principle which guides behaviour, that is, performance. Yet another of his systems of pragmatic 'knowledge' is what he calls 'interface pragmatics'; this is a system for integrating data from the language module and other sources (e.g., perceptual)

in assigning referents to indexical expressions. Again, this is a performance mechanism and, although its input includes linguistically given material (the ‘referential schemes’ provided by indexical forms), it necessarily uses information from other non-linguistic systems and integrates these various inputs in accordance with some non-linguistic principle of best fit. My suggestion is that when it comes to internalist pragmatic theorizing a shift from a competence to a performance perspective is virtually inevitable.

However, there is another set of linguistic facts that has been claimed to constitute a domain for a “linguistic pragmatic competence” or a “discourse competence”, as a component of linguistic competence. This is the domain of those distinct but truth-conditionally equivalent syntactic structures or referential options, which have quite different effects on understanding. For example, the two structures in (5) and the indefinite/definite alternation in (6):

- (5) (a) The children found Sally.
- (b) It was the children who found Sally.
- (6) (a) Last week I read a book and I met an author.
- (b) Last week I read a book and I met the author.

Prince (1988) makes a strong case for a pragmatic competence, which consists of “the principles underlying a speaker’s choice of a particular syntactic or referential option in a context and the principles underlying a hearer’s understanding of it” (Prince, 1988, pp. 166–167). She is surely right that native speakers know of the cleft structure in (5b) that it is appropriately used in certain contexts and not others, and, similarly, for the use of the definite/indefinite alternates. This is certainly linguistic knowledge and it is knowledge that concerns appropriate use, so it can be called discourse or pragmatic knowledge. However, it raises some of the same issues as Montague’s use of the term pragmatics for the study of indexicals and, like that study, might as well be reckoned to fall within semantics, although it is plainly not a matter for a purely truth-conditional account. In this respect, these facts fall together with Grice’s conventional implicature case (e.g., *but, moreover, therefore*); on the relevance-theoretic decoding/inference distinction, they all, clearly, fall on the decoding side, though what they encode might be better thought of as a rule for use rather than a concept or representational constituent. I return briefly to this issue in the last section where the idea of ‘procedural’ semantics is considered.

As long as one does not take the line that pragmatics is the semantics of indexicals or the semantics of any other sort of linguistic form, such as those that carry information about speech acts or appropriate context type, it seems that there is remarkably little forthcoming as a viable body of pragmatic *knowledge*. Kasher, like relevance theorists, has a single very general pragmatic principle, from which he claims the Gricean maxims can be shown to follow, a principle which constrains speakers in the linguistic forms they employ in their utterances and guides ad-

addressees in their interpretations of utterances. It seems that the bid to combine pragmatics with an internalist psychological view of language, albeit one with a competence starting point, inevitably turns into an account in terms of performance mechanisms. On such an account, the semantics/pragmatics interface must, in fact, be the point of contact of the linguistic parser and the inferential mechanism(s). The parser, which employs the linguistic knowledge constituting grammatical competence, delivers a logical form or schema of some sort (whether a Chomskyan LF or some variant), which provides an essential input, along with relevant information from perceptual and conceptual sources, to the rationally constrained interpretive inferential processes. Necessarily, these on-line processes, both those of the linguistic parser and those of the pragmatic system, receive input sequentially over time (left-to-right, as it were) and are themselves time-constrained and effort-involving, in a way that the derivations formulated within a competence system are not. To the extent that Kasher's talk of *generating* conversational implicatures is a terminological transfer from a production/comprehension-neutral 'generative' grammar, it should be dropped from the performance-oriented account now emerging. Rather, speakers communicate certain assumptions implicitly, and addressees pragmatically infer these implicitly communicated assumptions (implicatures). This, at least, is the stance taken within relevance theory.

2.3. *Philosophical semantics and pragmatics*

The semantics of the strict formalists is a system which pairs forms and truth evaluations, while the internalists' semantics is one component of an account of native speakers' knowledge of their language, that component concerning knowledge of linguistic meaning. These two positions are very far from exhausting the possibilities and there are considerable variations within them. In this section, I shall briefly, and perhaps somewhat idiosyncratically, review some of the ways in which the semantics/pragmatics distinction has been conceived of in the philosophy of language.

2.3.1. *Proposition types*

As opposed to the formalists with their pure semantic concerns, philosophers like Frege and Russell, who have had considerable influence on work on natural language semantics, were primarily interested in something else and looked to semantics as a means in the investigation of that something else: thought, propositions, facts, the structure of the world. So, for instance, the fundamental distinction between two types of proposition or thought, singular and general, is taken to be reflected in the semantics of natural language sentences. Pairing up sentence types with the proposition types they express, whether singular or general, has its motivation in an interest in those proposition types and in such epistemological matters as ways of knowing an object (whether by direct acquaintance or via a description)

and the metaphysical issue of non-existent entities. On Russell's view, a sentence with a genuine referring expression as subject, say an indexical, expresses a singular proposition containing the individual referred to as a constituent; a sentence with a description, or some other quantifier, as subject expresses a general proposition. Understanding a sentence involves grasping the proposition it expresses, and if the proposition is singular it is only fully grasped by someone who is in the appropriate epistemic relation with the particular individual referred to. The sentence semantics proposed is, of course, much closer to the formalists than the internalists, as characterized above; the sentence expresses a proposition with such and such truth conditions.

In this sort of semantical project, subservient to a bigger agenda, there is no discernible semantics/pragmatics distinction in evidence, although some of the ingredients that will enter into accounts that do respect such a distinction are here, specifically the interest in thoughts/propositions and what's involved in grasping particular proposition types, which seem to bear on the pragmatic issue of understanding utterances. However, there is little or no interest in actual use of language, in seeing sentences as tools for communication; rather, sentences are reflections of these other entities.

The move to language use and communication came with the reactions of Strawson and, especially, Donnellan to Russell's account of definite descriptions. In his discussion of the referential and attributive uses of descriptions, Donnellan (1966/91) passingly employs a semantics/pragmatics distinction. On the attributive use, a definite description sentence ("The F is G") expresses a general proposition; on a referential use, the very same definite description sentence expresses a singular proposition. In principle, every description can be used in either of these ways, quantificationally or referentially, and this is not, he says, a matter of **semantic** ambiguity but of **pragmatic** ambiguity. It's not a semantic ambiguity because it doesn't reside in lexical or syntactic ambiguity, that is, in the linguistic system itself. It is a matter of speaker use of the description, specifically of the sort of intention that informs the use. This is a particularly significant turn of thinking, since while the referential/attribution distinction is conceived of as a pragmatic matter, it appears also to be a truth-conditional ambiguity, in that different propositions are expressed on the two uses. This opens the way to a distinction between the semantics of a linguistic expression (a sentence), on the one hand, and the proposition expressed, on the other, the apparent gap between the two mediated by considerations of use, of speaker intention, of pragmatics. The main response to Donnellan's observations about the referential use of descriptions has been to invoke the Gricean distinction between saying and implicating, so that 'what is said', the proposition expressed, is the same across all uses, a general proposition, though, on occasion, a singular one may be communicated as an implicature (see Neale, 1990). However, this does not do justice to Donnellan's insight, in which a distinction is being made between linguistic semantics and proposition expressed (or truth-conditional content).

The issue is further opened up by recent observations of Nunberg (1993) concerning sentences with referring expressions, such as indexicals or demonstratives, which seem to be expressing general descriptive propositions rather than singular ones, as the direct reference view entails:

- (7) (a) I am traditionally allowed to choose my last meal.
 (spoken by a condemned prisoner, the night before execution)
- (b) The founding fathers have invested in me the power to appoint
 Supreme Court Justices.
 (spoken by the current president)
- (c) Tomorrow is always the biggest party of the year.
 (referring to the day before college classes begin)

Like Donnellan, Nunberg does not posit a linguistic semantic ambiguity here; the first person encodes just that rule or constraint or character that points to its speaker. Pragmatics interacts with linguistic semantics in determining the proposition expressed (whether singular or general). The Gricean gambit, of preserving the dictates of linguistic convention in a level of what is said, and treating all aspects of meaning due to communicative conditions as belonging to a distinct level of conversational implicature, cannot be applied to (7a) and (7c). The attempt would result in incoherence at the level of what is said or proposition expressed; since the adverbs *traditionally* and *always* quantify over instances, both “I” and “tomorrow” have to be interpreted as referring to a recurrent property (“the condemned prisoner”, “the day before classes begin”) rather than to the individual who is the speaker or to the particular day that follows the day of utterance. It seems, then, that both sentences with descriptions and sentences with indexicals can express singular propositions, and both can express general propositions, though, clearly, their linguistic meaning is very different and the routes (pragmatic, inferential) to these interpretations commensurately different.

Strawson (1950)’s insistence that it is speakers who refer, not linguistic expressions, and that it is speakers who express propositions, not sentences, is pertinent here. Putting that together with Donnellan’s talk of pragmatic ambiguity and with “the pragmatic view” (coming in Section 2.3.3), according to which no sentence of natural language, qua sentence type, expresses a proposition or has a determinate truth-condition, leads to a dismantling of the sentence type/proposition type correlation of Frege, Russell and (perhaps) Grice. It is not that there are not such proposition types, nor that there is not a distinction to be made between species of knowledge (by description, by direct acquaintance, etc.), but that the relation between the expressive tools provided by the linguistic system (words, sentences) and what they can be used to express is one-to-many. The particular expressive relation on any given occasion of use is determined pragmatically.

2.3.2. Proposition expressed

Grice's location in this sketchy map of positions on the semantics/pragmatics distinction needs to be considered. He is something of a hybrid figure. He is rightly thought of as the founder of inferential pragmatics; his system of conversational maxims and his insistence on a rational inferential process of working out the non-conventional or conversational implicatures of an utterance are the basis for the bulk of work in current pragmatics, both linguistic and philosophical. Yet he is also very much in line with the Russellian tradition: his concept of 'what is said' by a sentence or utterance seems to be but a variant of the pairing of sentences and propositions, and the basic motivation for his interest in properties of rational discourse was to separate off *what our words say* from *what we, in uttering them, imply* (Grice, 1986, p. 59). So among the uses to which he put conversational implicature was in defence of Russell's semantics for definite descriptions against the challenges from both Strawson and Donnellan; the idea is to maintain Russell's quantificational account at the level of what is said for all occurrences of definite descriptions. The existential presupposition standardly carried by both positive and negative definite description sentences is accounted for as a conversational implicature, dependent on a manner maxim concerning the rational presentation of one's information. As mentioned in the previous section, a similar approach is taken to the communication, on the referential use, of a singular proposition; it too is a case of conversational implicature, worked out on the basis of considerations of relevance and/or informativeness.

So how is the distinction between semantics and pragmatics drawn by Grice? It is not at all clear. The terms 'semantics' and 'pragmatics' don't appear in his work; his fundamental distinction was between 'saying' and 'implicating'. He seems to have intended 'what is said' to be the truth-conditional content of an utterance and 'what is implicated' to be the rest (i.e., non-truth-conditional). For those who take it that truth conditions are what semantics is all about, this might well look like just another set of terms for the semantics/pragmatics distinction. However, "what is said" seems to be a concept belonging to the realm of language use, to the theory of utterances or speech acts, rather than to sentence semantics. This is particularly evident in Grice's earlier work, where he distinguished between "the statement made" and a variety of types of implication (Grice, 1961). He moved on to the wider term "what is said", in order to encompass the proposition explicitly expressed across different speech act types, including stating, telling or asking.

Paraphrasing Grice (1975, p. 44), for a full identification of what a speaker has said, one needs to know the identity of the referents of any referring expressions and the intended meaning of any ambiguous linguistic forms. While these two requirements, which go beyond the conventional or encoded linguistic meaning, are taken to be determined by context, they are apparently satisfied without the involvement of the conversational maxims, which are employed just in the derivation of conversational implicatures. There are two possible construals of this: (a) "what is said" just is semantics and, as Bach (1997) contends, there is an accompa-

nying notion of semantic context, narrow context, comprising just those contextual features necessary for the determination of referents and 'operative meaning', or (b) disambiguation and reference assignment are pragmatic processes, involving considerations of plausibility, informativeness or relevance, and so pragmatics plays an essential role in the determination of the truth-conditional content of the utterance. The first construal, which it seems likely was intended by Grice, makes his 'what is said' a speech-act equivalent of the linguistic entity to which the formalists assign truth conditions. Indeed, a guiding assumption of many recent semantic programmes (from Davidson to Kaplan) is as follows: 'An adequate semantic theory *T* for a language *L* should assign *p* as the semantic content of a sentence *S* in *L* iff in uttering *S* a speaker says that *p*', where "says" is understood as the Gricean notion.⁵ The second construal, on the other hand, forces a disjunction between linguistic semantics (conventional or encoded linguistic meaning) and truth conditions; in a much developed and extended form, this is the 'semantic underdeterminacy' thesis, a central tenet of relevance theory, or what Travis (1997) calls 'the pragmatic view' (to be discussed in the next section).

The Gricean picture is further complicated once we recall that there is a range of linguistic forms which apparently do not contribute to truth conditions, hence not to what is said, but which, assuredly, do encode meaning of some sort; in Grice's terms, they give rise to an implicature (that is, to an element of non-truth-conditional utterance meaning), not due to any maxims of communicative behaviour, but via a convention (a linguistic semantic convention, presumably). Among the particular cases he discussed are *but*, *therefore*, and *moreover*, whose conventional meaning does not bear on the statement(s) made by an utterance in which they feature; they have a semantics, but that semantics is not truth-conditional. Grice's status as a speech act theorist, alluded to above, is especially clear in his treatment of these elements; while they do not contribute to the speech act of saying, hence not to the basic (central, ground-floor) speech acts of stating, telling or asking, they enter into higher-level (non-central) speech acts of commenting on the basic ones. For instance, an utterance of "P but Q" (where P and Q have been expressed by indicative sentences) may perform the two basic speech acts of stating (that P, and that Q) and a further higher-level speech act of contrasting these two statements. The truth value of the proposition expressed by this non-central speech act does not affect the truth value of the utterance, which is determined just by the values of P and of Q.

In strand five of his retrospective epilogue (1989a, pp. 359–365), Grice puts up two types of utterance meaning as candidates for signification which is somehow central or primary: the *dictive* and the *formal*. Formal signification is all that

⁵ See discussion by Cappelen and Lepore (1997) who criticize the adequacy of this as a basis for a semantic theory, since many reports of what someone has said plainly overlap only partially with the semantic content of the original sentence uttered. Reimer (1998) retorts that they are wrong to take "says" here in a pre-theoretic, ordinary usage sense; rather, as used by semanticists, "says" should be (and standardly is) understood as the strict Gricean notion of "saying".

meaning for which he elsewhere employs the term 'conventional', whether entering into what is said (truth conditions) or implicature. Dictive meaning appears to be another term for what is said, meaning which is usually some combination of (some of the) formally given meaning and of (some of the) contextually supplied meaning. This pull between two different notions of central meaning or primary signification in natural language use arises constantly throughout work in semantics; it is fundamentally a tension between semantics as truth-conditional content (what is said, the minimal proposition expressed, dictive content), on the one hand, and semantics as what the syntactic elements of a natural language encode (linguistic conventions, formal significance, encoded information of varying sorts that partially determines the ultimate interpretation), on the other hand.⁶

On the relevance-theoretic view, coming up shortly, the semantics half of the semantics/pragmatics distinction is precisely the linguistically encoded content, Grice's formal or conventional meaning, and the concept of the proposition expressed (the dictive) is not a purely semantic matter but an amalgam of linguistically encoded meaning and pragmatically inferred meaning. There is no pairing of linguistic objects, sentences, with propositions or proposition types.

2.3.3. *The pragmatic view: two kinds of semantics*

Travis (1997) usefully distinguishes two non-equivalent ways in which pragmatics has been characterized (P1 and P2), and, pretty much in accordance with the observations in the previous section, two non-equivalent ways in which semantics has been characterized (S1 and S2). According to P1, pragmatics is concerned with those linguistic phenomena left untreated by phonology, syntax and semantics; according to P2, it is concerned with those properties of words which arise as a result of their having been used, uttered in particular contexts. According to S1, semantics is concerned with certain relations between words and the world, in particular those on which the truth or falsity of words depends; according to S2, semantics is concerned with the meanings of the words and sentences that comprise a language. These characterizations can be played with in a variety of ways; S1 and S2 might be combined, so giving the much vaunted view that sentences of a natural language can be assigned conditions for truth, and that their meanings are given by stating these conditions. P1 and P2 might be combined in some way, so that pragmatics is concerned with all those features of a language which concern general conditions on its use. Alternatively, the characterizations might be kept apart and the different relations between semantics and pragmatics that they give rise to (four, in principle) considered. Travis opts for what he calls 'the pragmatic view', according to which questions of truth do not arise for expressions of a language: any sentence 'may have any of indefinitely many different truth conditions', dependent on the way in which they are used and the circumstances in which they are used, and any

⁶ A further distinction, recently advocated by Reimer (1997), is that between 'the semantic content of contextually relativized sentences' and 'the semantic content of utterances of such sentences'.

word may “make any of many different contributions to truth conditions of wholes in which it figures as a part” (Travis, 1997, p. 87). On this view, S1 semantics (truth conditions) includes, or at least overlaps with, P2 pragmatics (properties that arise through speaking), and semantics as in S2 has little or nothing to do with truth conditions. This is a view that he has been defending for some time (see Travis, 1981, 1985, 1991). Here are some of his examples:

- (8) (a) The kettle is black.
 (b) The table was covered with butter.
 (c) Hugo is a sailor.

Discussing what is meant by the predicate ‘black’ in (8a), he considers a range of possible circumstances:

Suppose the kettle is normal aluminum, but soot covered; normal aluminum but painted; cast iron, but glowing from heat; cast iron but enamelled white on the inside; on the outside; cast iron with a lot of brown grease stains on the outside; etc. (Compare a postage stamp, black on one side – a black stamp?, a ‘yellow’ labrador retriever painted to look like a black one – is the dog black? a ‘black’ narcissus, with a green stem; the North Sea [look at it from the deck on a normal North Sea day, then pull up a bucket of it and look at that].)

(Travis, 1985, p. 197)

The point is that the sentence in (8a), like virtually all sentences, may be used to say any of indefinitely many distinct things, each of which is true under different conditions. The bearer of truth is not the sentence but the proposition or thought the speaker uses the sentence to express on the given occasion of utterance. One of the sources of these propositional differences in (8a) is the property communicated by the predicate ‘black’, both what property that is (clearly visible black, a wider colour spectrum taking in various dark browns, invisible black and any other way of being relevantly black) and what exactly it is taken to apply to (the whole kettle, just the outside, or some other salient part of it). Exactly the same issues arise for (8b) and (8c); Travis spins numerous possible ways in which butter might be conceived of as covering a table and Hugo might be conceived of as a sailor (that is, different sets of truth conditions for different occasions of use of the sentence).

He does not pursue the complexities of where, if at all, P1 (linguistic pragmatics) fits into ‘the pragmatic view’. Much depends on what the account of S2 (linguistic meaning) encompasses; if, as suggested above, its domain is the stable, context-general meaning properties of all linguistic expressions, then it is not obvious that there are any properly *linguistic* phenomena left untreated by semantics, so the only pragmatics is the pragmatics of communication (speaking and understanding). If this is right, it raises difficulties for the view of internalist semantics as essentially consisting of a statement of (native speakers’ knowledge of) truth conditions, including the Burgean conditional truth conditions discussed

above, in which the context-dependent properties of indexicals and demonstratives are effectively abstracted away. Travis's point is that, for any utterance, the contribution made by any, and potentially all, of the linguistic items employed is context-dependent, so that a statement of THE truth conditions of a sentence is not possible. Similar observations were made by the so-called 'ordinary language' philosophers, Wittgenstein and Austin, in their moves away from the then dominant practice in the philosophy of language of trying to trim and tailor natural language to the pattern and properties of artificial logical systems. Chomsky's rejection of a referential semantics for natural language expressions, mentioned in the previous section, is also closely allied to Travis's 'pragmatic view' and, as will be seen, the semantics/pragmatics relation entailed here is highly consonant with the relevance-theoretic view, which is the focus of the rest of the paper.

In what follows, the usual order of consideration of the partners in the semantics/pragmatics distinction is reversed: I start with pragmatics. A pragmatic theory is taken to be an account of the cognitive psychological processes involved in understanding utterances (or ostensive acts more widely), and the appropriate conception of semantics follows from this. In fact, we'll start even further away from linguistic semantics than that, since the basic assumptions of relevance theory are not restricted to linguistic processing, nor to communication, but apply to all human cognition (or information processing).

3. Relevance-theoretic pragmatics

3.1. Cognitive basics: relevance-seeking and mind-reading

In this section, I outline a basic claim or assumption on which the relevance-theoretic account rests and put it together with a widely observed fact about the way humans interpret each other's behaviour. The basic assumption is that the human cognitive system is oriented towards the maximization of relevance. Relevance is defined as a property of inputs to cognitive processes; it is a function of cognitive effects and of the processing effort expended in deriving those effects. Cognitive effects (or contextual effects) include the strengthening of existing assumptions of the system, by providing further evidence for them, the elimination of assumptions that appear to be false, in the light of the new evidence, the derivation of new assumptions through the interaction of the new information with existing assumptions. What it means for the cognitive system to be oriented to the maximization of relevance is that the various subsystems involved conspire together so as to tend to achieve the greatest number of cognitive effects for the least processing effort overall. The idea is that the various perceptual input systems have evolved in such a way that they generally respond automatically to stimuli which are very likely to have cognitive effects, quickly converting them into the sort of representational formats that are appropriate inputs to the conceptual inferential

systems; these systems then integrate them, as efficiently as possible, with some accessible subset of existing representations to achieve as many cognitive effects as possible. For fuller exposition, see Sperber and Wilson (1986) and Sperber and Wilson (1995, pp. 261–266).

The widely observed fact about how humans interpret each other's behaviour is the following: if some behaviour we observe can be understood both in purely physical terms and in mentalistic (intentional) terms we will almost inevitably go for the latter (Sperber, 1994, p. 187). Imagine observing a scene in which a man lowers himself, head and arms first, down into a hole in the ground while another man holds onto his legs. Very few observers will represent this scene to themselves as I have just described it and leave it at that; most of us will try to find some plausible beliefs, desires and/or intentions that we can attribute to these two men, some set of mental states which will explain their behaviour. For instance, we may attribute to both men a **belief** that there is something worth retrieving down in that hole, to the first man an **intention** to retrieve it, to the second man a **belief** that the first may fall into the hole and hurt himself if his legs aren't held, etc. Then, suppose the second man, who is holding the legs of the first, swivels his eyes leftwards in our direction and starts to jerk his head quite violently from left to right. Chances are we'll take him to be communicating something to us; we'll take the head movement to be, not some involuntary tic he developed upon seeing us, but rather a movement designed to make it evident to us that he wants our attention and has something to tell us. We might even hazard a guess at (infer) what the intended message is, something like 'I want you to help me' perhaps. Note that this is achieved **without any element of encoding** whatsoever; the same type of head movement would be interpreted in quite different ways in different situations.

We can't help doing this sort of thing, that is, we can't help attributing intentions, with quite specific content, to others; it seems to be built into our cognitive system for interpreting the behaviour of our fellow humans and we tend to extend it (erroneously) to the interpretation of the behaviour of some other species and certain human-made machines too. This capacity is more intelligent than one that assumes an intentional explanation is to be given for all observed outcomes of human action; it extends to a consideration of the sorts of intentions people are likely to have and those they are not likely to have. So if the second man loses his grip on the first man's legs and the first man emerges some time later covered in slime, we will recognize these physical happenings as undesirable to the men and so not to be explained in terms of any intentions they had. Or, if there is some desirable outcome to this behaviour, but one which the men could not reasonably be expected to have foreseen, we will not try to explain it in terms of their beliefs or intentions. In short, we attribute intentions when it seems relevant to do so; that is, when it will extend or confirm our existing understanding of how the world (including human minds) works; in other words, when it has certain sorts of cognitive effects. This capacity is not confined to one or two levels of attribution nor to attributions which

involve but a single cogniser: you can attribute to **me** an **intention** to get **you** to **believe** that some **third person** does not **want** to go to a party. The mental faculty responsible for this is generally called our 'theory of mind' or 'mind-reading' capacity and there is now a huge psychological literature on its nature, its place in our overall cognitive architecture, how it develops in infancy, its impairment in certain pathological conditions such as autism and its manifestation in other primate species (see, for instance, Baron-Cohen et al. (1993)).

Utterances and other kinds of **ostensive** behaviours, such as the head-wagging of the man described above, are explained by the attribution to their originators of a particular sort of intention, which Sperber and Wilson (1986, pp. 50–64) call a 'communicative intention'. This is an intrinsically higher-order mental state, as it is an intention to make evident an intention to inform someone of something (to state, tell, ask, make known something). Naturally, the mind-reading capacity is employed in interpreting ostensive behaviour; it would be very odd if it wasn't, since this sort of behaviour carries with it a presumption of a certain appreciable level of relevance (that is, of cognitive effects for minimal processing effort) for the interpreter, by virtue of its overt demand for attention, something which does not accompany other (non-ostensive) behaviours. This is captured by the "Communicative Principle of Relevance": every act of ostension communicates a presumption of its own optimal relevance; that is, a presumption that it will be at least relevant enough to warrant the addressee's attention, and moreover, as relevant as the communicator is able and willing to make it. Processing by the addressee's cognitive system in line with this presumption is automatically triggered by an ostensive stimulus, irrespective of the actual intentions of the producer of the stimulus. There is quite generally a motivation for inferring the (informative) intention of the communicator, an incentive which is absent from other situations of mental-state attribution, so that it seems to have become an innately specified response. The presumption of relevance carried by ostensive stimuli gives rise to a comprehension procedure that hearers use in their interpretation: following a path of least effort, they look for an interpretation which satisfies their expectation of relevance, and when they find one they stop.

Most existing work within the relevance-theoretic framework involves applying it to some aspect of the understanding of verbal utterances, but, as regards the structure of the theory itself, linguistic expressions are not its most basic objects. The protagonists in the story are thoughts (private, unobservable) and ostensive acts (public, observable) which are performed in order to communicate thoughts. The communicative intention can be made manifest by a range of types of ostensive acts (winking, nodding, pointing, sniffing, nose-wrinkling, eyebrow-raising, eye-rolling, miming, etc. and a huge variety of different non-linguistic sounds). The sometimes massive disparity between the thought(s) falling within the communicative intention and the information encoded in the ostensive act is bridged by the interpreter's pragmatic inferential powers. These inferential processes function in essentially the same way whether or not combined with coded information.

Obviously, the use of a linguistic system, or some other code, for ostensive purposes provides the relevance-constrained inferential mechanisms with information of a much more fine-grained and determinate sort than is otherwise available, and so hugely facilitates communication. However, for communication to succeed, it is sometimes necessary for the relevance-oriented mind-reading capacity to overrule the determinate dictates of the linguistic system, and this it is often able to do. Key data for this sort of pragmatic theory are provided by a variety of linguistic mistakes, misuses and contradictions, such as the following:

- (9) (a) I enjoy Martial's witty epigrams.
 (b) The penguins have eaten all our cabbages.
 (spoken in an English garden) (example from Deirdre Wilson)
- (10) Smith's murderer is insane.
 (where 'Smith's murderer' is used to refer to a particular individual, in the case where there is in fact no murderer of Smith)
- (11) A: Have you taken the aspirin?
 B: No, I haven't taken it, but I've taken it.
 [= I haven't swallowed it but I've pocketed it]
- (12) Kato (of O.J. Simpson, at his trial):
 He was upset but he wasn't upset.
 [= He was [upset]' but he wasn't [upset]]'

The example in (9a) is to be taken as a case of a speaker using the wrong lexical form for her intended concept *epigram*, either because she simply has the wrong concept-form mapping in her lexicon or because she has made an on-the-spot slip of the tongue; (9b) is, most likely, of the latter production error variety. In many instances, these will be correctly interpreted, that is, interpreted in line with the speaker's informative intention, although she hasn't produced the best possible linguistic evidence to ensure fulfillment of that intention. The example in (10) is a case of Donnellan's well-known referentially used definite descriptions, where the description is improper, in that it is actually false of the intended referent. Again, in a great many instances, communication will be successful, the addressee will recognize who the intended referent is, even if he does not believe of the referent that he is Smith's murderer. The examples in (11) and (12), both attested cases of successful communication, take two tokens of a single lexical concept, treating each as a point of departure for pragmatic inferencing to two distinct concepts, so that they are not understood as expressing contradictory propositions. Explaining these cases of successful mind-reading is a basic task of a pragmatic theory concerned with actual processes of utterance understanding, a task the relevance-theoretic account is equipped to handle. As data for a semantic theory, they are of no particular interest and will be subsumed in that theory's general account of

word and sentence meaning; on most accounts of 'what is said' by these utterances, something false, and in the last two cases necessarily false, is said, although this has no bearing on the interpretive process.

3.2. Cognitive pragmatics and the semantic underdeterminacy thesis

It follows from the sort of relevance-driven processing just outlined that the linguistically encoded element of an utterance should not generally be geared towards achieving as high a degree of explicitness as possible, but should rather take account of the addressee's immediately accessible assumptions and the inferences he can readily draw. A speaker who fails to heed this, or gets it wrong, causes her hearer unnecessary processing effort (for instance, pointless decoding of concepts which are already activated, or highly accessible to him), and runs the risk of not being understood or, at the least, of being found irritating and/or patronizing, etc. So subsentential utterances, employing a phrase or just a single word, are often more appropriate than a complete sentence, and many fully sentential utterances involve unarticulated constituents which, given the hearer's available contextual assumptions, are immediately recoverable:

- (13)
- | | | |
|-----|------------------------|---------------|
| (a) | Paracetamol is better. | [than what?] |
| (b) | It's the same. | [as what?] |
| (c) | He is too young. | [for what?] |
| (d) | She's leaving. | [from where?] |
| (e) | It's raining. | [where?] |

This picture meshes well with the 'pragmatic view' of natural language discussed in Section 2.3.3, a view which I will develop further shortly under the title 'the semantic underdeterminacy thesis', where by 'semantic' here is meant the meaning or information which is encoded in linguistic forms. What this thesis says is that the linguistic form employed by a speaker inevitably underdetermines the proposition she explicitly expresses because natural language sentences do not encode full propositions but merely schemes for the construction of (truth-evaluable) propositional forms.

The examples in (13) are obvious cases of linguistic semantics (logical form) underdetermining the proposition expressed; they require a pragmatic process of completion before they can be judged as true or false descriptions of a state of affairs. However, they do not show that this is an inevitable property of linguistic communication, as I am claiming, because, after all, a speaker could have used a sentence which encoded the missing constituent:

- (14)
- | | |
|-----|---|
| (a) | Paracetamol is better than nurofen. |
| (b) | Ibuprofen is the same as nurofen. |
| (c) | Leonardo DiCaprio is too young to play the part of King Lear. |

It has been argued that while the linguistic semantics of an utterance often does in practice underdetermine the proposition it explicitly expresses, this is just a matter of convenience for speakers and hearers, and another sentence which fully encodes the proposition expressed (an eternal sentence) could always be supplied if the occasion seemed to warrant it. This is one version of a strong 'effability principle', according to which each proposition (or thought) can be encoded by some sentence in any natural language.⁷

The view which incorporates the effability principle, the notion of eternal sentences and the 'inessential but convenient' conception of pragmatics, can be called the 'semantic view', intended to suggest a contrast with Travis's 'pragmatic view' above. So, according to Katz (1972, p. 126): "a [non-eternal sentence]... can be expanded on the basis of the information in the context to provide another sentence that... always makes the statement in question, no matter what the context of utterance. The expansion consists of replacing each indexical element by an expression that has the same reference as the indexical element it replaces but whose referent stays fixed with variations in time, place, speaker, etc." In other words, the infinite set of sentences that a linguistic system generates can be partitioned into two infinite subsets, one consisting of the underdetermining non-eternal sentences, which speakers find a very convenient effort-saving means of communicating their thoughts, and the other consisting of the infinite set of fully determining (i.e., proposition encoding) eternal sentences, which can be employed when total explicitness, leaving no room for interpretive manoeuvre, is called for.

A different view of pragmatic inference was suggested in the previous section, according to which this sort of inferential activity is an automatic response of receivers of (attention pre-empting) ostensive stimuli; it is but a particular instance of our general propensity to interpret human behaviour in terms of the mental states (beliefs, desires, intentions) of the behavior, which, in its turn, is to be located within a bigger picture of general relevance-seeking information processing. According to this view, pragmatic inference is fundamental and the employment of a code (linguistic system) as an ostensive stimulus is a useful addition; it would not be reasonable to expect, nor would it be particularly desirable, that the forms supplied by the code should be eternal or even fully propositional. I have argued elsewhere that the effability principle, at least in its strong form above, and the accompanying claim that there are eternal sentences, are wrong (Carston, 1998). With a lot of help from Recanati (1987, 1993, 1994) and Travis (1985, 1991), I set out to show that for none of the categories of referring expressions, predicates, quantifiers, and clausal relations are there cases of semantic encodings which enter in a determinate, context-independent way into the truth conditions of utterances that employ them. Referring expressions are probably the most obvious case. According to the quotation above from Katz, for each indexical expression of a non-eternal sentence

⁷ For detailed discussion of different versions of the 'effability principle' see (Sperber and Wilson, 1986, pp. 191–192; Recanati, 1994; Carston, 1998, Chapter 2).

used to express a particular proposition, its eternal sentence counterpart contains a referring expression whose referent is fixed and invariant across all contexts of use. But what do these referring expressions look like? The most likely candidates are proper names and 'complete' definite descriptions, such as 'the table Ken Jones is sitting at at t_1 '. But any proper name can be used to refer to many different individuals and there are no linguistic forms which encode the sort of specific temporal reference represented lamely here by " t_1 ".

Furthermore, the reference of these expressions is relative to the domain of discourse, where possible domains are the actual world, a fragment of the actual world, someone's belief world, a fictional world, a fragment of some counterfactual world. Recanati presents the following sort of case: you and I know that Lucinda wrongly believes that Peter Mandelson is the Prime Minister of Britain in 1998. Knowing that Mandelson is in the next room, I utter (15) to you:

- (15) If Lucinda goes into the next room she'll have the pleasure of meeting the current Prime Minister of Britain.

I am here using the definite description to refer to Mandelson rather than the actual PM, because I intend the utterance to be interpreted with respect to Lucinda's belief-world within which Mandelson is the Prime Minister in 1998. This relativity of reference can be extended in a fairly obvious way even to cases of rigid descriptions, such as 'the cube root of 27'.

Some examples of the intrinsically context-dependent nature of the truth-conditional contribution of natural language predicates were given above in Section 2.3.3. Consider another case:

- (16) A: Do you want to go to the party?

B: I'm tired.

Most of us are tired to some degree or other most of the time; what B communicates by the predicate 'tired' in this context is something much more specific, something paraphraseable as 'tired to an extent that makes going to the party undesirable to B'. Just how narrowed down this ad hoc concept of tiredness is will depend on other contextually available information, perhaps concerning B's general energy levels, her liking for parties, etc. The prospects for finding another lexical item or phrase which fully encodes the concept of tiredness communicated here, and still others that encode the innumerable other concepts of tiredness that may be communicated by the use of this word in other contexts, look dim. (For more detailed discussion of this example, see Sperber and Wilson (1997).) In other words, as well as not uniquely determining the objects they can be used to refer to, natural language expressions seem to be intrinsically underdetermining of the properties and relations they may be used to predicate of an object.

Given the relevance-theoretic view of pragmatic inference, this sort of underdeterminacy is to be expected; all that is required of the linguistic code is that it aid

or direct the independently functioning inferential mechanism, not that it should encode the proposition the communicator expresses. The evidence suggests that it is just this fairly minimal requirement that the linguistic system meets; in short, it seems to support the pragmatic view over the semantic view.

4. The semantics/pragmatics distinction and the explicit/implicit distinction

4.1. Gricean '*what is said*' again

The explicit/implicit distinction concerns the assumptions or propositions communicated by an utterance. That there is some such distinction to be made is strongly supported by intuition; most people would agree that in example (16), just above, B has explicitly communicated that she is tired and she has implied, implicated or indirectly communicated that she doesn't want to go to the party. The distinction has its roots in the Gricean saying/implicating distinction, touched on in Section 2.3.2, though his primary interest in drawing it was to rescue a range of philosophical analyses under attack from ordinary language philosophers like Austin, Wittgenstein and Strawson, rather than to capture a communicative distinction (see Travis (1991); Neale (1992); Carston (1998, Chapter 3) for extensive discussion). Two of Grice's examples are given in (17):

- (17) (a) It looks red to me.
(b) He took off his boots and got into bed.

An allegation Grice sought to counter was that (17a) cannot be correctly used by a speaker referring to a bright red pillar-box, which she is standing in front of and can see clearly, because the correct use of "looks red to me" requires that there be some doubt about the redness of the object referred to. Grice used his distinction to isolate the (true) statement made by an utterance of (17a) from its (false) conversational implicature, arising from standard assumptions of conversational informativeness and relevance, that there is some doubt about its actually being red. In the case of (17b), there is a conversational implicature that the removal of the boots preceded the getting into bed, derived via considerations of rational orderly presentation of material, so that at the level of what is said, or the statement made, the order of the clauses is irrelevant and the word *and* can be given the same conventional content (semantics) as its logical truth-functional counterpart. Conversational implicature was seen as a very useful philosophical tool by Grice and other philosophers, for siphoning off non-central aspects of utterance meaning, leaving the core philosophical statement to be assessed for truth; that core '*what is said*' is as close to encoded (conventional) semantic content as a truth-evaluable entity can be.

Once we couple an explicit/implicit distinction with the semantic underdeterminacy view, it becomes clear that the Gricean distinction has to be abandoned or quite radically reconstrued. There are at least the following two possibilities: (a) the concept of what is said has to be understood as involving much more of a pragmatic contribution than Grice acknowledged, a contribution which is as much driven by conversational maxims or communicative principles as is the derivation of conversational implicatures; (b) a very constrained, semantically-oriented concept of what is said can be maintained, but only at the cost of recognizing a further representational level, between what is said and what is implicated. Bach (1994a, 1994b) adopts the second approach; he takes what is said to be determined by just encoded content, certain cases of indexical reference assignment and disambiguation, and accepts that it is often subpropositional (so not truth-evaluable). He posits a level of implicature (distinct from implicature), a propositional representation at which the linguistically given what is said has been pragmatically completed and, on occasion, enriched. However, his conception of 'what is said' seems to be redundant in a cognitive processing account of utterance understanding, since it plays no role in the interpretation which is not already played by the independently motivated level of logical form. I have discussed Bach's ideas in some detail in Carston (1998, Chapter 3) and won't pursue them further here.

The first approach, a reconstrual of 'what is said' so as to allow for a much greater input from pragmatics has been developed by Recanati (1989, 1993, 1994). Under the term 'contextualism', he takes up the position of the 'ordinary language philosophers' and defends it against the 'anti-contextualists', among whom he places Grice. In his view, Strawson (1952)'s observations about the non-truth-functional uses of natural language connectives such as *and*, *or*, *if*, are to be thought of in terms of the context-sensitivity of truth conditions, rather than as cases of rich linguistic encodings or lexical ambiguities. Generalizing, when a linguistic expression appears to have different meanings in different contexts, in addition to the two analytic options envisaged by Grice, (a) linguistic convention, and (b) conversational implicature, there is a third: (c) pragmatic contribution to truth conditions. My account of the various temporal and cause-consequence understandings of *and*-conjunctions is an account of this third sort (see Carston, 1988, 1993, 1998), and Recanati has put this option to good use in supporting Donnellan's pragmatic but truth-conditional ambiguity of definite descriptions and in accounting for apparent ambiguities in belief-report sentences (Recanati, 1993). The importance of this third option for the semantic/pragmatic analysis of particular linguistic expressions is that it has the two following properties: (a) it is pragmatic so, like implicature accounts, it is favored by economy considerations such as Modified Occam's Razor ("senses are not to be multiplied beyond necessity"), while, at the same time, (b) like encoded linguistic information, it affects truth-conditional content, which implicatures, by definition, cannot do.

4.2. *Logical form and explicature*

Of the two types of divergence from Grice's saying/implicating distinction that the recognition of semantic underdeterminacy can lead to, the first is the route taken by relevance theory in developing the concept of explicature. At the time they were formulating their ideas about cognitive relevance, Wilson and Sperber (1981) pointed out that, once the two basic processes of disambiguation and reference assignment have taken place, the processing of the utterance in (18a) will have progressed to (18b), but in most instances a hearer would interpret (18a) as expressing something more specific than (18b), say (18c) in circumstances in which John Murray is playing the violin in front of the speaker and hearer.

- (18) (a) John plays well.
 (b) John Murray plays some musical instrument well.
 (c) John Murray plays the violin well.

They note a couple of important features of (18c): it entails (hence is more informative than) (18b) and it is on the basis of (18c) rather than (18b) that the implicatures of the utterance would be worked out. They suggest that although (18b) is fully propositional and so truth-evaluable, it is (18c) that is the proposition explicitly expressed by the speaker (the truth-conditional content of the utterance). This idea drives a wedge between those semanticists who would characterize the meaning of the **sentence** in (18a) in truth-conditional terms, and the cognitive pragmatist who takes the truth-conditional content of an **utterance** of (18a), in a particular context, to be (18c).

The gap between linguistically decoded information and proposition explicitly expressed is not bridged just by the processes of reference assignment and disambiguation.⁸ First, there are the completion processes required by utterances of the sentences in (13) in order to arrive at anything of a propositional sort at all. Then, there are such pragmatic processes as identifying the domain over which the quantifier in (19a) ranges and the relevant relation between Mary and the picture in (19b); these may be examples of linguistically mandated pragmatic processes in that the logical form contains a variable indicating the necessity of contextual instantiation in the two instances (pragmatic saturation cases, in Recanati's terms):

⁸ Katz (1972, p. 449) and Walker (1975, pp. 156–157) noted that the context-dependent processes, identification of reference and disambiguation, that Grice recognized as necessary in determining 'what is said' were often just as dependent on the conversational maxims (or the more general Cooperative Principle) as conversational implicatures. Given this, the restriction of pragmatic inferencing to just these two sorts of contribution to determining a level of proposition explicitly communicated seems arbitrary.

- (19) (a) Everyone went to the party.
 (a') Everyone in my pragmatics seminar went to the party.
 (b) I like Mary's picture best.
 (b') I like best the picture that Mary bought from the exhibition.

However, the cases that really show the radical difference between a semantically oriented notion of what is said and the appropriate concept of what is explicitly communicated within a cognitive processing account of utterance interpretation are those where a minimally propositional (hence truth-conditional) representation is further elaborated in deriving that more informative or more relevant proposition which is the one the speaker can be reasonably taken to have intended to communicate. Example (18a) is such a case and so, arguably, are the following:

- (20) (a) He took off his boots and got into bed.
 (b) She gave him a push and he fell over the edge.
 (c) Writing my essay will take time.
 (d) He hasn't had any lunch.

For each of these examples, the result of reference assignment and disambiguation is a truth-evaluable propositional representation; (20a) is true iff both of the following are true: X removed his boots at some time prior to the time of utterance, and X got into bed at some time prior to the time of utterance; (20c) is true iff the activity of the speaker's writing her essay Y will occupy a time-span (a couple of milliseconds, for instance). As with (18a), these are not the propositions intended by the speaker nor the ones understood by the addressee; the temporal sequence communicated by (20a), the cause-consequence relation communicated by (20b), and the concept of an appreciable length of time communicated by (20c) are all aspects of the explicitly communicated proposition.⁹

These examples can be viewed as cases of conceptual expansion, of strengthening achieved by the addition of conceptual material; for example, 'he hasn't had any lunch *today*'. There are other cases where it seems that a lexical concept appearing in the logical form is pragmatically adjusted so that the concept understood as communicated by the particular lexical item is different from, and replaces, the concept it encodes; it is narrower, looser or some combination of the two, so that its denotation merely overlaps with the denotation of the lexical concept from which it was derived. A case of this sort of ad hoc concept formation was given earlier in (12), repeated here:

⁹ The thesis that the encoded linguistic meaning of utterances typically falls far short of determining the proposition expressed by an utterance is supported by a number of philosophers now. In addition to Travis, Recanati and Bach, it is discussed by Atlas (1977, 1989), Manor (1995), and Turner (1997), to name just a few.

(12) Kato (of O.J. Simpson, at his trial):

He was upset but he wasn't upset.

[= He was [upset]' but he wasn't [upset]]"

As far as its linguistically supplied information goes this is a contradiction, but it was not intended or understood this way. The two instances of the word "upset" were understood as communicating different concepts of upsetness, at least one, but most likely both, involving a pragmatic enrichment of the encoded lexical concept UPSET; the second of the two concepts carries certain implications that the first one does not, implications whose applicability to Simpson Kato wants to deny. The proposition explicitly expressed here is true just in case O.J. Simpson had one sort of property at the time in question, but lacked another, related but stronger property.

Briefly consider now (21a–d), some potential cases of pragmatic loosening of a concept:

- (21) (a) The steak is raw.
- (b) Holland is flat.
- (c) Jane is a bulldozer.
- (d) Jane isn't a bulldozer.
- (e) Bill is a human being.
- (f) Bill isn't a human being.

In many contexts the property attributed to the steak in (21a) is not literal uncookedness, but a weaker one of undercookedness, which shares some but not all of the implications of the stronger one; similar comments apply to (21b) and (21c). The interest of (21d) is that although the linguistically encoded content of 'not a bulldozer' is literally true of Jane, it is a trivial, hence irrelevant, truth and what is understood as being denied is her having the property that is communicated by the loose use of the concept BULLDOZER in (21c). Examples (21e) and its negation (21f) are the enrichment counterparts, in that the property predicated of Bill in (21e) is narrower than the encoded one that denotes a particular species, and this is denied in (21f). These pragmatic narrowings and loosening of encoded concepts are entirely local, so can fall within the scope of negation. For further discussion, see (Carston, 1996, 1998; Sperber and Wilson, 1997).

Within the relevance-theoretic account of utterance interpretation, where the aim is to delineate the set of assumptions that are communicated and the processes by which they are derived, these cases are viewed as showing further ways in which pragmatic processing mediates between logical form and the proposition explicitly expressed by (the explicature of) an utterance. What this entails is that not only do pragmatic inferences build on, and flesh out, logical form, but they may also result in the loss of some element of encoded linguistic meaning featuring in the logical

form; this is the case for the loose uses in (21a–d). For instance, the proposition explicitly communicated by (21a) is true just in case the steak in question is [raw*], where [raw*] does not entail uncookedness. This makes it very clear how distant the concept of the proposition explicitly communicated in this cognitively-based account of verbal communication is from the philosophically-based, semantically-oriented concept of ‘what is said’. There is no role in the cognitive account for ‘what is said’ construed as the proposition literally and strictly expressed, so departing but minimally from linguistically encoded meaning.¹⁰

The relevance-theoretic explicature/implicature distinction is a distinction among the propositional forms communicated by the utterance (the assumptions falling under the speaker’s communicative intention, speaker-meant, in Grice’s terms). It is a derivational distinction. An explicature is derived by inferentially developing the logical form of the utterance. All other communicated assumptions are implicatures; they are derived by inference alone, inference in which the explicature is one of the premises. Different token explicatures having the same propositional content may vary with regard to the relative contributions made by decoding and inference. That is, they may vary in degree of explicitness:

- (22) (a) Mary Jones put the book by Chomsky on the table in the downstairs sitting-room.
 (b) Mary put the book on the table.
 (c) She put it there.
 (d) On the table.

All of these could be used in different contexts to communicate explicitly one and the same propositional form. Clearly (22c) and (22d) leave a great deal more to pragmatic inference than does (22b), which in turn is less explicit than (22a). Given the essential nature of the underdeterminacy thesis, no linguistic expression will achieve full explicitness; that is, will fully encode the propositional form communicated.

The overall picture here is of a semantic representation (of the syntactic logical form variety already discussed), which is the linguistic input to relevance-seeking pragmatic inferential processes, which eventuate in a set of communicated propositional forms, explicatures and implicatures, each of which could be given a truth-conditional semantics, but none of which is, or is encoded by, a natural language sentence.

¹⁰ One might wonder where, if at all, the intuitive notion of ‘literal meaning’ fits into the story given here. Bach (1997, pp. 44–46) argues for words having a literal meaning and equates the literal meaning of an utterance with his semantic conception of “what is said”. I have no quarrel with the first of these; literal meaning is what words encode. I have already argued against his notion of what is said with its accompanying construct of narrow context (Carston, 1998, Chapter 3). The only coherent notion of literal meaning of an utterance is its encoded meaning; this is a mix of conceptual and procedural meaning waiting to be (pragmatically) turned into propositional representations, so is graspable only in part by native speakers.

5. Relevance-theoretic semantics

Having given some idea of how pragmatics is conceived of on this internalist, cognitive processing (performance) view, it is time to return to semantics, keeping in mind that by ‘semantics’ what is meant here is a relation between bits of linguistic form and the cognitive information they encode, rather than a relation between forms and entities in the external world. In this final section, some of the implications of relevance-theoretic pragmatics for linguistic semantics are considered. As I’ve indicated at various points throughout the paper, a number of elements of linguistic form, including indexicals, certain non-truth-conditional connectives and some non-canonical linguistic structures, have been deemed to be, in some sense, inherently pragmatic. In Section 5.2, I briefly consider the idea that these are to be understood as encoding information about inferential processing, that is, procedural information. First, though, the location of the central semantic notion of truth conditions within this account is considered.¹¹

5.1. *Logical form and truth conditions*

The semantics/pragmatics interface is a representational level described as logical form or the linguistic semantic representation; it is standardly not fully propositional but rather a schema for the construction of fully propositional representations. Exactly what this looks like is, of course, an important question and not one that can be answered yet with any great conviction. A reasonable construal is of a structured string of concepts, configured along the lines of Chomskyan LF, perhaps indicating relative scope of quantifiers and negation, and with open slots marking constituents that must be contextually filled, as in the case of indexicals, quantifier domains, and many other elements.

Levinson (1988, 1989, forthcoming) contends that this sort of view, held by relevance-theorists (along with those generative grammarians who investigate a syntactically determined level of Logical Form, and Katz and Jackendoff, whose ‘semantic’ representations are similar in the crucial syntactic respect), is one of ‘semantic retreat’ and constitutes ‘throwing in the sponge’ (Levinson, 1988, p. 59). Much that he says in this context is right: that this sort of semantics consists of the algorithmic extraction of a semantic representation from a syntactic representation; that the result of this is an extremely impoverished level of representation

¹¹ There is a further large and fascinating topic here, which I do not have space to pursue, concerning the use of a representation, whether linguistic or mental, to represent another representation, as opposed to its use to represent a state of affairs. The relation between representation and represented on such a use is one of resemblance rather than of truth/falsity. Cases include quotation, various ways of indirectly reporting speech and thought, mention (as opposed to use) of an expression, and echoic uses, where the main point is to express an attitude to an attributed utterance or thought. These raise important semantic/pragmatic issues not least of which is whether they fall in the domain of linguistic semantics or of pragmatics. For discussion, see (Sperber and Wilson, 1986, 1988b; Wilson, forthcoming).

with scope of operators possibly undecided, metavariables for pronouns, etc.; that traditional sense relations cannot be captured at this level of semantic representation. But these points are presented as backing up the following assertion: that relevance-theorists hold a 'Stichian' position on semantics and have given up on real semantics (representation-world relations) altogether. I think this is false. Stich holds a syntactic theory of mind according to which, ultimately, the scientific psychological explanation of human behaviour will dispense with talk of intentional (semantic) states such as beliefs (about the world) and desires (that the world be such and such); explanation will be couched entirely in terms of the causal role of structured strings of a mentalese (Stich, 1983). Like virtually everyone who espouses a computational view of the mind, Sperber and Wilson assume that cognitive processes are responsive to only the formal properties (shapes and configuration) of mental representations (this is variously known as "methodological solipsism", internalism, individualism). However, they line up with Fodor rather than Stich (or Chomsky) on the ultimate semantic issue: the structured conceptual complexes of the language of thought are *representations* in the full sense, so as well as their intrinsic organism-internal properties, they have relational properties in that their content (semantics) is determined, at least in part, by their relation to the outside world. A full account of human psychology (including generalizations about how we come to have the beliefs, etc. that we do have and how we come to act on our environment as we do) will require an (externalist) semantics of mental representations, but this lies outside the domain of a theory of the cognitive processes and representations involved in utterance understanding.

In fact, Levinson's characterization of the sort of semantic theories he approves of, Kamp's discourse representation theory (Kamp and Reyle, 1993) and File Change Semantics (Heim, 1983), bears great similarity to the relevance-theoretic position. He says: "... to adopt a metaphor, in these theories [DRT and File Change Semantics] there is a common slate, a level of propositional representation, upon which both *semantics* and pragmatics can write – the contributions may be distinguished, let's suppose, by the colour of the ink: *semantics* in blue, pragmatics in red! *Semantics* and pragmatics remain modular "pens" as it were: they are separate devices making distinctively different contributions to a common level of representation. The slate thus represents the *semantic* and pragmatic content of accumulated utterances, and it is this representation as a whole that is assigned a model-theoretic interpretation" (Levinson (1988, p. 22)) highlighting added by me). Note the consistent use of the term 'semantic' here; this blue ink is not truth-conditional semantics but something much more like the relevance-theoretic notion of linguistic semantics as decoded meaning: it is subpropositional (hence the need for the red contributions to the common level of propositional representation) and, crucially, it is a level of representation; that is, it is a translation from one symbolic system into another, with this latter being given a 'real' semantics ('a model-theoretic interpretation').

5.2. Two types of encoding: conceptual and procedural

In this section, I leave aside the issue of a ‘real’, externalist semantics and focus on relevance-theoretic work on an internalist (translational) semantics. In a series of publications (see reference list), Diane Blakemore has developed the idea that linguistic meaning can provide two quite distinct types of input to pragmatic inferential processes. On the one hand, linguistic forms may encode concepts. Concepts function as constituents of those mental representations that undergo inferential computations (i.e., conceptual representations), so the concepts encoded by the linguistic expressions used in an utterance make up its logical form and provide the conceptual basis for the development of explicatures (the fully propositional assumptions explicitly communicated). On the other hand, linguistic forms may encode procedures. Procedures are not constituents of conceptual representations, but rather function as constraints on some aspect of the inferential phase of comprehension. To illustrate, consider the following examples:

- (23) (a) Squirrels love peanuts.
- (b) Moreover, squirrels love peanuts.
- (c) They love them.
- (d) LOVE (SQUIRRELS, PEANUTS)

Most nouns, verbs, adjectives and adverbs seem to encode a concept, which bears logical relations with other concepts. For instance, the conceptual representation corresponding to the proposition expressed by an utterance of (23a) may consist of a structured string of the concepts encoded by the three words, something like (23d). (I say “may”, since the encoded concepts might be adjusted by pragmatic processes of enrichment or loosening, as discussed in Section 4.2). The sentence in (23b) contains the additional lexical item, *moreover*, which is standardly assumed not to enter into the proposition expressed. The claim here is that its encoded linguistic meaning does not appear in any conceptual representation at all, because it does not encode anything conceptual, but rather indicates the sort of inferential process the proposition expressed is to enter into. The sentence in (23c) might be used to express exactly the same proposition as an utterance of (23a); the conceptual representation of that proposition will not include the encoded linguistic meaning of the two pronouns. As is generally agreed, pronouns and demonstratives encode a rule for, or constraint on, finding a referent (see Kaplan, 1977/89). In short, expression of the proposition that squirrels love peanuts may be achieved by the utterance of any of (23a–c); the meaning encoded by *moreover* and by the indexicals drops out of the picture.

The relevance-theoretic view is that both indexicals and discourse connectives encode a procedure rather than a concept. On the face of it, these may appear to be two rather disparate phenomena, but what unites them is that they can be

characterized, negatively, as not contributing a constituent to any conceptual representation and, positively, as providing an instruction to the hearer to guide him in the pragmatic inferential phase of understanding an utterance. The difference between them is that indexicals constrain the inferential construction of **explicatures** and discourse connectives constrain the derivation of **implicatures** (that is, intended contextual assumptions and contextual effects).

Blakemore's focus has been on discourse connectives like *but*, *after all*, *moreover*, *therefore* and *so*, those cases that Grice classified as devices of conventional implicature, contributing to higher-level speech acts. For instance, consider the examples in (24):

- (24) (a) She can pay. (b) After all, she's rich.
 (c) She's rich. (d) So she can pay.
 (e) She's rich. (f) But she's generous.

According to Blakemore, the connectives in these examples do not contribute to any conceptual representation, whether ground-level or higher-level. Rather, they indicate to the hearer what type of inference process he should perform in deriving the cognitive (contextual) effects of the propositions explicitly communicated by the utterance. The use of *after all* indicates that (24b) is to be used as evidence in support of (24a); the use of *so* indicates that (24d) should be processed as a contextual implication of (24c); the use of *but* indicates that (24f) should be interpreted as contradicting and eliminating a possible implication of (24e). Interestingly, this analysis of these particular discourse connectives relates their encoded instruction directly to one of the three main types of cognitive (or contextual) effect that establish the relevance of an utterance: strengthening an existing assumption, contradicting and eliminating an existing assumption and deriving new assumptions (see Section 3.1). It is, of course, possible for the particular inferential interaction in each case to take place without any connective to direct the hearer; for instance, a hearer of (24b) might recognize it as providing backing for the statement made by (24a) without the encoded instruction provided by *after all*. What the use of these linguistic elements does is greatly increase the salience of a particular inferential relationship, so that, in those cases where the intended interaction is not already obvious to the hearer, the connective saves him the effort of trying to work out what sort of inferential computation he is to perform. Blakemore points out that these are just the sort of effort-saving devices you would expect to be provided by a code which is subservient to a relevance-driven inferential processing mechanism, a mechanism which is geared to derive cognitive effects at least cost to the processing resources of the system.

The notion of procedural encoding was initially applied just to cases of this sort, linguistic expressions whose crucial property is that they do not affect the proposition expressed by, hence the truth conditions of, the utterance. The insight was

later extended to linguistic expressions whose impact is felt at the level of explicature, including the proposition expressed by an utterance (Wilson, 1991; Wilson and Sperber, 1993). Among the pragmatic tasks at this level are disambiguation and reference assignment. Disambiguation is inherently constrained; the linguistic system supplies a restricted range of specific options for pragmatic selection. The task of assigning individual and temporal referents is a bit different: what pronouns and tense indicate is a broad constraint on the type of referent to supply, for instance, a singular female individual, or a time prior to the time of utterance, that is, they reduce the hypothesis space that has to be searched in arriving at the intended referent. Wilson and Sperber (1988a) and Wilson (1991) further suggest that the information carried by non-declarative syntax (for instance, the imperative mood, interrogative word order, illocutionary devices such as *please*, *let's*, *huh*, *eh*) is procedural and functions as a constraint, not on the proposition expressed but, on a higher-level explicature which represents the speech act performed. For instance, an utterance of (25a) might communicate the explicature in (25b), where the logical form of the utterance has been pragmatically developed in such a way that it is embedded in a speech act description:

- (25) (a) Open the window, please.
 (b) The speaker is requesting me to open the window.

So we see that a variety of inferential pragmatic tasks may be constrained and guided by encoded procedures: reference assignment, illocutionary force identification, and the derivation of implicatures. A further crucial job for pragmatics is working out the intended context, the set of assumptions with which the explicitly communicated assumptions are to interact in the search for relevance. A tentative initial hypothesis about (some of) the syntactic structures discussed by Prince (1988), such as clefting and preposing, whose truth-conditional effect is identical with canonical declarative word order, is that they encode an instruction about the sort of context within which the propositional content is to be processed.¹²

¹² Ideas which bear an interesting similarity to those discussed in this section are currently being explored by the logical semanticist David Kaplan. His starting position is very different from that of relevance theorists; he follows Montague in thinking of language as a formal system, to be subjected to the rigors of a model-theoretic semantics. In a recent seminar series (Kaplan, 1998), he was at pains to retrieve from (the netherworld of) pragmatics and restore to semantics, not only indexicals, but also a range of terms, broadly characterized as expressives, including connectives like *but*, *although*, *nevertheless*, honorifics, expletives, and interjections like *ouch* and *oops*. He postulates two systems of semantic knowledge: a Semantics of Meaning (Fregean senses) and a Semantics of Use. The domain of the latter is that range of expressions mentioned above, which are usually left out of any logically-based semantics and labeled "pragmatic"; Kaplan's important claim for formal semantics is that these use-oriented expressions do enter into certain logical relationships and can, and should, be accommodated within the model-theoretic approach. His distinction between a semantics of sense and a semantics of use correlates, to some degree at least, with the cognitively based distinction between conceptual and procedural meaning.

5.3. Conceptual encoding, indicating and truth-conditional semantics

In this final section, I return to the probably less controversial domain of conceptual encoding, focusing on a particular class of cases, sentence adverbials, including speech act adverbials such as *frankly*, and *confidentially*, and attitudinal adverbials such as *sadly* and *fortunately*. These are of particular interest because while speech act theorists have categorized them, together with conventional implicature expressions like *but*, as indicators, as opposed to describing expressions (see Austin, 1962; Urmson, 1963; Bach and Harnish, 1979), they are classed as conceptual rather than procedural by relevance theorists (see Ifantidou-Trouki, 1993; Wilson, 1991). Furthermore, they have been given a truth-conditional treatment by natural language semanticists who pursue that approach (for instance, Lycan (1984)), something not attempted for conventional implicature cases, as far as I am aware. So while they are truth-conditional, according to this tradition, they are non-truth-conditional, according to the speech act tradition. On the face of it, this is an odd state of affairs that calls, at the least, for some clarification. These adverbials strike me as a key case for teasing out the relation between the various different distinctions made in different approaches to semantics: conceptual vs. procedural, truth-conditional vs. non-truth-conditional, describing (saying) vs. indicating.

First, given the conceptual/procedural encoding distinction, it is clear that they fall on the conceptual side. They do not function as constraints on pragmatic inference processes any more than the lexical items in the sentence *Squirrels love peanuts* do. Furthermore, they have synonymous manner adverbial counterparts which do contribute a conceptual constituent to the proposition expressed, as illustrated in (26a).

- (26) (a) Mary admitted to me confidentially that she is going to resign.
 (b) Confidentially, I'm going to resign.
 (c) Mary is going to resign.
 (d) The speaker of (26b) is telling the hearer confidentially that she is going to resign.

When we move to the distinction between the truth-conditional content of the utterance (the proposition expressed) and elements of utterance meaning which are not truth-conditional, it seems to be equally clear that the sentence adverbials considered here belong in the latter category. The proposition expressed, or what is said, by an utterance of (26b) is given in (26c). It is for this reason that speech act theorists take these adverbials to be indicating rather than describing elements, expressions that contribute to the speech act performed (a 'confidential telling', in this case). Relevance theorists take them to contribute to what is explicitly communicated, but to a higher-level explicature rather than to the basic level one which

constitutes the truth-conditional content of the utterance. An utterance of (26b) by Mary communicates a higher-level explicature along the lines of (26d).

So the speech act theorists' class of indicators includes both procedural elements and conceptual ones. This is, I think, the result of an exclusive focus on language use, on the speech acts performed by language users. Describing (or saying) versus indicating is not a semantic distinction, in the sense of a distinction between types of linguistic encoding, but is a use distinction, separating out elements that contribute to the locutionary act from those that contribute to the illocutionary act. It follows from this that while the describing/indicating distinction correlates with the truth-conditional/non-truth-conditional distinction as applied to the content of **utterances**, the cognitive semantic distinction between conceptual and procedural does not. Some conceptual encodings contribute to the proposition expressed (e.g., *squirrel, love*), some do not (e.g., *confidentially, frankly*); some procedural encodings constrain the proposition expressed (e.g., indexicals, tense), some (perhaps most) do not (e.g., *but, moreover*, cleft structure).

Let's bring in the third group of players, which includes Lycan (1984), Higginbotham (1988, 1989, 1994) and many others, whose aim is to give a semantic account of natural language **sentences** (as opposed to utterances), and subsentential forms, in terms of truth conditions. A truth statement for the sentence adverbial *confidentially* might look something like that in (27):

- (27) If an utterance of *Confidentially*, S is an act by X of stating that P to Y, then that utterance is true just in case X states in confidence to Y that P.

I make no claim of adequacy for this rough attempt; the account given by Lycan (1984, pp. 148–152) is rather more complex. The point is that there is no principled reason why the sort of truth-conditional account outlined in Section 2.2 should not be able to accommodate the sentence adverbials. This is of interest for two reasons, the first a clarificatory matter, the second potentially more substantive. First, the question whether or not a particular linguistic element is truth-conditional or not is ambiguous. The two distinct questions are: (a) Can the element be given a truth-conditional semantics, qua semantics of the **linguistic system**? (b) Does the meaning encoded by the element contribute to the truth conditions of the **utterance**? In the case of *frankly, confidentially, fortunately*, etc. the answer to the first is “yes” and the answer to the second is “no”. In short, before we can answer the question “truth-conditional or not?”, we need to know whether we are being asked about linguistic semantics or the proposition expressed by an utterance.

The more substantive issue concerns the relation between the conceptual/procedural distinction (a linguistic semantic distinction) and the truth-conditional specifications given by natural language semanticists like Lycan, Higginbotham, and Larson and Segal (1995). It seems clear that every encoding considered to be conceptual by a relevance-theorist is treated as truth-conditional by them. What about the class of procedural encodings, where do they fit into the truth-conditional semantic story? Higginbotham (1994) and Segal (1994) concede that

Grice's conventional implicature cases (hence Blakemore's cases of constraints on implicatures) are not going to be covered by a truth-conditional account. As far as I can see, the same goes for the non-canonical syntactic structures discussed above. Indexicals and other expressions whose semantic value is inherently context-sensitive are effectively set aside, so that the truth statement for sentences containing them can be given as if their value were fixed (see Section 2.2). In other words, these use-conditional, as opposed to truth-conditional, elements get a mixed treatment dependent on whether they constrain the proposition a sentence can express or not. The last question is whether both a conceptual/procedural encoding account and a truth-conditional semantic account are needed in the final big picture, a picture which perhaps incorporates both an account of semantic **competence**, of what it is to know the meaning of expressions of one's language, and an account of the representations and processes involved in understanding utterances of expressions of one's language, a **performance** matter. I don't think this question can be answered at this stage.

6. Finale

I shall finish with a brief speculative consideration. Suppose that the relevance-theoretic view that natural-language sentences do not have a truth-conditional semantics is correct and that it is thoughts or sentences of mentalese that have the requisite degree of determinacy for pairing with a truth condition. Suppose also that the semantics of the linguistic code is given in terms of mappings between linguistic forms and concepts or procedures. The final interpretation of an utterance consists of a set of conceptual representations; some of the constituents of some of these representations will have been decoded from the linguistic expressions used; most will have been derived by pragmatic inferences and some of those inferences will have been constrained by procedures encoded in the linguistic expressions used. A truth-conditional semantics can be given for each of these conceptual representations making up the interpretation. The speculation is that all of that encoded meaning which is conceptual falls in the domain of this truth-conditional account, while none of that encoded meaning which is procedural does. In short, a conceptual semantics maps into a truth-conditional semantics. This has two interesting implications: (a) the work currently being done within the truth-conditional approach to linguistic semantics can be reconceptualised as a semantics for (part of) the language of thought, and (b) the truth-conditional project can quite legitimately abstract away from, indeed ignore, context-sensitive or use-conditional linguistic forms, such as indexicals and discourse connectives, those elements which some semanticists have viewed as imperfections in natural language and which have raised problems for formal logical methods.

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CHAPTER 5

English Indefinite Noun Phrases and Plurality

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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1. Introduction

The most natural assumption to make about the interpretation of the grammatical number of a noun phrase is that a grammatically singular noun phrase should be interpreted in terms of some single object and a grammatically plural noun phrase should be interpreted in terms of some objects whose number is greater than one. Singular English noun phrases formed with the indefinite article and their plural counterparts present this natural assumption with a dilemma.

Consider two circumstances. In the first, three men – call them William, Dan, and Reed – pool their resources to buy a single house. In the second, each of them buys his own house. Now consider the following pair of sentences:

- (1.1) The men bought a house
- (1.2) The men bought houses,

where we suppose that the subject noun phrase in each sentence refers to William, Dan, and Reed. Clearly, the first sentence can express the first circumstance and the second sentence can express the second. This is as expected, in light of the natural assumption pertaining to the interpretation of grammatical number, as spelled out above. However, the first sentence can also express the second circumstance, which is contrary to the natural assumption, since three houses are bought but the word *house* in (1.1) has singular grammatical number. Such is the first horn of the dilemma.

It might be thought that the reason the first sentence can also express the second circumstance is that it expresses a circumstance in which each man is associated with a single house. But, how does the second sentence, where the noun *house* has plural grammatical number, manage to express this very same circumstance, in spite of each man's being supposed to have bought only one house? Such is the second horn of the dilemma.

Strikingly, this dilemma does not arise when the sentences in (1) are put in the passive.

- (2.1) A house was bought by the men
- (2.2) Houses were bought by the men.

Here, the sentence in (2.1) expresses the first circumstance, but, unlike the sentence in (1.1), it does not express the second circumstance. The sentence in (2.2), like the sentence in (1.2), expresses the second circumstance, but not the first.

Striking also is the fact that this dilemma does not arise when the determiner *some*, a synonym of the indefinite article, replaces it in the sentences in (1), to yield

- (3.1) The men bought some house
- (3.2) The men bought some houses.

The first sentence in (3), like the first sentence in (2), expresses only the first circumstance; and the second sentence in (3), like the second sentence in (2), expresses only the second circumstance.

2. The data

The dilemma is not confined to the configuration of transitive verbs with plural subject noun phrases and singular indefinite noun phrases, as evinced by the sentences in (1)–(3). Rather, it arises not only in other configurations but also with noun phrases just like singular indefinite noun phrases except that the indefinite article is replaced by a numerical adjective for any whole number greater than one and the noun is put in the plural.

2.1. Simple clauses

Let us turn our attention first to simple clauses with singular indefinite noun phrases. To begin with, the dilemma appears with sentences with di-transitive verbs whose indirect object is a plural noun phrase and whose direct object is an indefinite singular noun phrase.

(4.1) Isabelle gave the children a cookie

(4.2) Isabelle gave the children cookies.

Consider two circumstances. In the first, Isabelle gives three children – Alice, Margot, and Colleen – one and the same cookie; in the second, she gives each of the children a different cookie. The first sentence can express the first circumstance and the second can express the second. In addition, while the second sentence cannot express the first circumstance, the first can nevertheless express the second. It is easy to see that the sentences in (4) replicate the dilemma occasioned by the sentences in (1).

Again, observe that the dilemma does not arise when the determiner *some* replaces the indefinite article.

(5.1) Isabelle gave the children some cookie

(5.2) Isabelle gave the children some cookies.

Likewise, the dilemma does not arise for one of the passive forms of the sentences in (4), namely, the one where the direct object becomes the subject.

(6.1) A cookie was given to the children by Isabelle

(6.2) Cookies were given to the children by Isabelle.

Yet the dilemma appears for the other passive form of the sentences in (4), namely, the one where the indirect object becomes the subject. Notice, however, that the position of the indefinite noun phrase with respect to the position of the plural noun phrase in (7) below is similar to the position of the indefinite noun phrase with respect to the plural noun phrase in (1).

(7.1) The children were given a cookie by Isabelle

(7.2) The children were given cookies by Isabelle.

Still other instances of this dilemma arise with either a plural subject noun phrase or a plural object noun phrase and a prepositional phrase whose noun phrase is indefinite.

(8.1) The birds live in a cage.

(8.2) The birds live in cages.

(9.1) William parked the cars in a garage.

(9.2) William parked the cars in garages.

As the reader can easily verify, the dilemma does not arise when the indefinite article is replaced by the determiner *some*.

Finally, the same dilemma emerges within noun phrases themselves whose head nouns are plural and whose prepositional complements have prepositions whose objects are indefinite noun phrases.

(10.1) houses which have a lease

(10.2) houses which have leases

The first phrase can be true of each house in a set of houses, all of which fall under the same lease, while the second phrase can be true of each house in a set of houses, each with its own lease. However, the first phrase can also be true of each house in the second set.

Observe that the dilemma arises independently of the occurrence of any verb, as shown by the next examples.

(11.1) brains in a vat

(11.2) brains in vats

(12.1) rooms with a door

(12.2) rooms with doors

Summarizing what we have seen thus far, we note that two conditions are necessary for the dilemma to arise. First, two constituents are involved, one of which is an indefinite singular noun phrase and the other either a plural noun phrase or a plural noun. Second, the plural noun or noun phrase c-commands the indefinite noun phrase. For our purposes, we can get by with the following relatively simple definition of the syntactic relation of c-command:

C-command:

Constituent x c-commands constituent y iff neither is x subordinate to y nor is y subordinate to x and y is subordinate to the constituent to which x is immediately subordinate.

2.2. Recursion

The elements involved in the dilemma need not be confined to the very same clause. For, as observed by Barbara Partee (reported as a personal communication in (Roberts, 1987, p. 247)), these sentences too exhibit the dilemma.

(13.1) The men bought a house which has a bronze statue

(13.2) The men bought houses which have bronze statues.

Once again, consider two circumstances. In the first, three men – William, Dan, and Reed – pool their resources to buy a single house which has a single bronze statue. In the second, each of them buys his own house and each house has a single bronze statue. Clearly, the first sentence can express the first circumstance and the second sentence can express the second. However, the first sentence can also express the second circumstance, where three bronze statues are involved, though the relevant noun has single grammatical number.

As always, the dilemma disappears either when the c-command condition is not met or when the indefinite article is replaced by the determiner *some*.

(14.1) A house which has a bronze statue was bought by the men

(14.2) Houses which have bronze statues were bought by the men

(15.1) The men bought a house which has some bronze statue

(15.2) The men bought houses which have some bronze statues.

2.3. Cardinal plural indefinites

The dilemma set out above occurs also when the relevant indefinite noun phrase is altered so that the indefinite article is replaced by a cardinal numeral for whole

numbers greater than one and the noun is put in the plural. Again, consider two circumstances. In the first, three men – William, Dan, and Reed – pool their resources to buy two houses. In the second, each of them buys two houses so that in total six houses bought. Now consider these sentences:

(16.1) The men bought two houses

(16.2) Two houses were bought by the men.

Either sentence can express the first circumstance, but only the first sentence can also express the second circumstance.

Analogous remarks apply to the adaptations, some of which are given below, of the other sentences discussed above.

(17.1) Isabelle gave the children two cookies

(17.2) The children were given two cookies by Isabelle

(17.3) Two cookies were given to the children by Isabelle

(18.1) houses with two leases

(18.2) cottages between two lakes

(19.1) The men bought two houses which have two bronze statues.

(19.2) Two houses which have two bronze statues were bought by the men.

3. Resolution of the dilemma

We now turn to the resolution of the dilemma. First, we shall see that plural noun phrases which have cardinal numerals in place of the indefinite article are, in fact, plural indefinite noun phrases. Second, we shall see that plural indefinite noun phrases are the plural counterparts of singular indefinite noun phrases. At the same time, we shall establish that the indefinite article and the determiner *some*, though equivalent in many contexts, are nonetheless different in usage. Third, we shall scrutinize the assumption pertaining to the semantic properties of grammatical number made above in the formulation of the dilemma and we shall discover independent grounds requiring the revision of those assumptions. And finally, we shall see how the conclusions drawn with respect to the foregoing work together to resolve the dilemma set out above.

3.1. Cardinal numerals as adjectives

The recent development of generalized quantifier theory has led many semanticists to embrace the treatment of cardinal numerals occurring initially in noun phrases as determiners. A less popular view is one which holds cardinal numerals in such a position to be adjectives which impose on the noun phrase the cardinality of its denotation.¹ Let us consider a few of the reasons which support the less popular view.

To simplify our exposition, we confine our attention to noun phrases which do not contain adverbs or other noun phrases and whose head noun is a single count noun occurring at the phrase's right edge; in other words, the noun phrases in question have the form:

(DET)(A) ... (A)N.

It has been known for some time that adjectives form a heterogeneous lot. As pointed by Levi (1978), adjectives are of at least two kinds: predictive and thematic.² In many cases, the adjectives are obtained derivationally from nouns, though in many cases they are not. Roughly, a predictive adjective attributes a quality to the denotation of the noun it modifies, while a thematic adjective ascribes a thematic relation holding between the denotation of the noun it modifies and some set of objects associated with the adjective. Table 1 provides examples, many of which are taken from Levi (1978).

Table 1

THEMATIC RELATION	EXAMPLE	PARAPHRASE
AGENT	presidential lie	lie by the president
PATIENT	electrical conductor	conductor of electricity
BENEFICIARY	avian sanctuary	sanctuary for birds
INSTRUMENT	solar generator	generator using the sun
MATERIAL	molecular chain	chain made of molecules
POSSESSOR	musical comedy	comedy which has music
POSSESSEE	reptilian scale	scale belonging to a reptile
CAUSE	malarial mosquito	mosquito causing malaria
EFFECT	thermal stress	stress caused by heat
LOCATION	atmospheric testing	testing in the atmosphere

More important than the notional characterization of these adjectives are their distributional properties. Predictive adjectives are so-called because they tolerate

¹ See (Bartsch, 1973; Gillon, 1984; Kamp and Reyle, 1993, Chapter 4.4.4).

² Awareness of this lexical class goes back in Europe to Aristotle, who treats them under the term 'paronymy' (*Categories*, Chapters 1, 8). Levi (1978) refers to thematic adjectives as non-predictive adjectives.

a paraphrase by a relative clause in which the adjective follows a suitable form of the verb *to be*. Thus, if A is a predicative adjective, a phrase of the form DET A N can be felicitously paraphrased by a phrase of the form DET N *who/which is/are* A. Such a paraphrase is either strained or unacceptable, should A be a thematic adjective.

- | | | |
|--------|-------------------------|----------------------------------|
| (25.1) | a rich lawyer | a lawyer who is rich |
| | this erroneous decision | this decision which is erroneous |
| (25.2) | a lunar module | *a module which is lunar |
| | a presidential lie | *a lie which is presidential |

All thematic adjective resist comparative and superlative forms, be they affixal or paraphrastic, whereas many predicative adjectives do not.³

- | | | |
|--------|--------------|------------------------|
| (26.1) | rich | richer |
| | erroneous | more erroneous |
| (26.2) | lunar | *more lunar (*lunarer) |
| | presidential | *more presidential |

Similarly, all thematic adjective resist modification by adverbial modifiers of degree (e.g., *very*), whereas many predicative adjectives do not.⁴

- | | | |
|--------|--------------|--------------------|
| (27.1) | rich | very rich |
| | erroneous | very erroneous |
| (27.2) | lunar | *very lunar |
| | presidential | *very presidential |

Fourth, although predicative adjectives iterate with themselves, thematic adjectives often do not.

- | | |
|--------|--------------------------------|
| (28.1) | a tall, pregnant woman |
| (28.2) | *a lunar, solar module |
| | a surgical, retinal detachment |

Fifth, whereas co-ordination is permitted with adjectives of the same kind, co-ordination with adjectives from the other kind is not permitted.

³ Notice that while many predicative adjectives resist comparative and superlative forms, they nonetheless can accommodate these forms, provided they undergo a shift of meaning. Thus, should one say *Mary is more pregnant than Julie*, the adjective *pregnant* must be re-interpreted to mean something like *has more of the overt signs of being pregnant than*. In a similar way, one can say *this landscape is more lunar than that one*, meaning that the first landscape more closely resembles the landscape of the moon than the second does.

⁴ Remarks similar to those made in the previous footnote apply here too.

Table 2

	PREDICTIVE	THEMATIC
admits paraphrase by a relative clause whose verb is a form of the verb <i>to be</i>	all	none
admits comparative or superlative forms	many	none
modification by an intensifying adverb (e.g., <i>very</i>)	many	none
iterate with themselves	yes	not freely
co-ordinate with an adjective from the other class	none	none
linear order	first	second

- (29) rich and famous advisor
 *rich and presidential advisor
 presidential and senatorial advisor

Finally, predictive adjectives and thematic adjectives may co-occur, and when they do, predictive adjectives precede thematic ones.

- (30) large, malarial mosquito
 *malarial, large mosquito

The foregoing is summarized in Table 2.

Notice that, while adjectives do not freely iterate with one another, predictive adjectives can be followed by other predictive adjectives and by at least one thematic adjective. This situation, as we shall see, stands in sharp contrast with determiners.

Uncontroversially, the class of determiners contains at least the following: the articles, definite and indefinite, the demonstrative adjectives, the interrogative adjectives, *some*, *each*, *all*, *every*, *no*, and *any*. These determiners do not, in general, follow one after the other (see Table 3).⁵

Now, never may a cardinal numeral immediately precede any of the determiners listed above. Thus, any sequence comprising a cardinal numeral (denoting a whole number greater than one), followed by a plural determiner, followed by a plural count noun, is unacceptable, whereas virtually any sequence comprising a plural determiner, followed by a cardinal numeral (denoting a whole number greater than one), followed by a plural count noun, is acceptable (see Table 4).

⁵ The determiners *both* and *all* may be immediately followed by exactly the determiner X which may occur in the partitive constructions *both/all of* X N. There is also the sequence *every which* in idioms such as *every which way*.

Table 3

*that a car	*a that car
*this which tie	*which this tie
*the each election	*the each election
*what the friends	*the what friends
*which that lawyer	*that which lawyer
*what some guard	*some what guard
*some these cars	*these some cars
*no which contrivance	*which no contrivance
*any no essay	*any no essay

Table 4

UNACCEPTABLE			ACCEPTABLE		
two	the	docks	the	two	docks
three	these	errors	these	three	errors
four	those	proposals	those	four	proposals
five	which	lamps	which	five	lamps
six	what	supplies	what	six	supplies
seven	some	guards	some	seven	guards
eight	all	ideas	all	eight	ideas
nine	no	elections	no	nine	elections
ten	any	cars	any	ten	cars

In short, cardinal numerals do not pattern with paradigmatic determiners. Rather, they pattern with adjectives. Thus, we have established the following:

$$A_{\text{cardinal}} A_{\text{predicative}} A_{\text{thematic}} N.$$

It appears to follow from these considerations that noun phrases whose initial element is a cardinal adjective do not have a determiner. Is this true? We shall address this question in the next section.

3.2. *The indefinite article*

As is well known, English common nouns are of two kinds: mass nouns and count nouns. English count nouns show free alternation between singular and plural, while English mass nouns do not, occurring only in the singular. Moreover, while English noun phrases headed by singular count nouns must begin with a deter-

Table 5

SINGULAR	PLURAL
what	what
which	which
the	the
this	these
that	those
some	some
no	no
any	any
each	all
every	all
a	—

miner, those headed by plural count nouns or by mass nouns do not. The question arises: Are determiners optional in English common noun phrases? If so, is it then just an accident that each English noun phrase headed by a singular count noun has a determiner? Or, are determiners obligatory in English common noun phrases? If so, must then English common noun phrases headed by either a plural count noun or a singular mass noun contain a phonetically null determiner?

The facts point to the second alternative. To begin with, observe that every English determiner but one – namely, the indefinite article – is either compatible with both singular and plural count nouns or has two suppletive forms, one for the singular and one for the plural, as shown in Table 5.

Next, note that, while the singular version of the demonstrative determiners occur with mass nouns, mass nouns do not tolerate the singular determiners *each* and *every*, rather they require the plural form *all*.

- (31) *each gold *every water
 all gold all water

Now, by filling the unique gap in the paradigm of English determiners, and by assuming that this phonetically null element behaves like *all* insofar as its co-occurrence restrictions are concerned, one can bring all English common noun phrases under one simple structure.

DET A_{cardinal} A_{predicative} A_{thematic} N.

Moreover, the unification of apparently determinerless plural common noun phrases and singular mass noun phrases with singular indefinite noun phrases bears

further dividends. First, one obtains a simple characterization of the distribution of noun phrases in so-called 'there existential' constructions, thereby obviating the distinction between so-called strong and weak determiners posited by Milsark (1974), which has proven so recalcitrant to either syntactic or semantic analysis.⁶

(32.1) There is a pot on the table

(32.2) There are pots on the table

(32.3) There is pottery on the table

Second, one obtains a simple characterization of which noun phrases may serve in predicates – whether the predicate is a verb phrase headed by a linking verb which takes a complementary noun phrase,⁷

(33.1) This is a shoe

(33.2) These are shoes

(33.3) This is footwear

or the predicate is headed by the preposition *as*:

(34.1) William thinks of a sandal as a shoe

(34.2) William thinks of sandals as shoes

(34.3) William thinks of sandals as footwear

(35.1) A Birkenstock sandal is outstanding as a shoe

(35.2) Birkenstock sandals are outstanding as shoes

(35.3) Birkenstock sandals are outstanding as footwear

While the indefinite article and *some* are both determiners which are extremely close in meaning, they have clearly different grammatical properties. One is that *some* may not replace the indefinite article in either of the environments specified above.

(36.1) ?There is some pot on the table

(36.2) *This is some shoe

(36.3) *William considers a sandal some shoe

(36.4) *A Birkenstock sandal is outstanding as some shoe

⁶ The earliest attempt to provide a semantic analysis of this distinction is found in Barwise and Cooper (1981). See Kamp and Reyle (1993, Chapter 4.4.4) for discussion of the shortcomings of the analysis by Barwise and Cooper.

⁷ Such verbs are: *to be*, *to become*, *to seem*, *to remain*, and *to stay*.

The easiest way to handle these distributional aspects of the indefinite article and the determiner *some* is as lexical properties. Linking verbs and the preposition *as*, when used to form a predictive constituent, subcategorize for indefinite noun phrases.

The foregoing is not the only contrast between the indefinite article and the determiner *some*. It is well known that noun phrases which are identical except that one has the indefinite article where the other has the determiner *some* exhibit different construals when they occur in verb phrases which are negated by the adverb *not*.

(37.1) Bill did not buy some car.

(37.2) Bill did not buy a car.

The former sentence only has one construal: namely, that there is some car which Bill did not buy. The latter has two construals: the less salient one, which coincides with the construal of the former sentence, and the more salient one, that it is not the case that Bill bought some car. Using some modified notation of classical quantificational logic, one can represent the construals as follows:

(38.1) [_{NP} some car]_x [_{Adv} not] [_S Bill buy *x*]

(38.2.1) [_{NP} a car]_x [_{Adv} not] [_S Bill buy *x*]

(38.2.2) [_{Adv} not] [_S Bill buy [_{NP} a car]]

In other words, if a negated verb phrase contains a noun phrase whose determiner is *some*, the noun phrase must be assigned scope over the verb phrase; whereas, if a negated verb phrase contains an indefinite noun phrase, the noun phrase need not be assigned scope over the verb phrase.

This regularity can be captured in terms of a lexical specification: noun phrases whose determiner is *some* must be assigned scope over the clauses in which they occur.

One should not be deterred from this simple explanation by a well-known observation pertaining to the scope properties of quantified noun phrases, as evinced by the sentences below.

(39.1) Each engineer inspected some house.

(39.2) Each engineer inspected a house.

Each of the two sentences is liable to two construals: one in which the choice of house depends on the choice of engineer (the so-called narrow scope reading for the object noun phrase), and the other in which the choice of house is independent of the choice of engineer (the so-called wide scope reading for the object noun phrase). On the second construal, the very same house was inspected by each of

the engineers. On the first construal, each engineer inspected a house, and possibly a house different from any of the houses inspected by any of the other engineers. Using again some modified notation of classical quantificational logic, one can represent these construals as follows:

(40.1.1) [*S* [*NP* each engineer] [*VP* inspected [*NP* some house]]

(40.1.2) [*NP* some house]_{*x*} [*S* [*NP* each engineer] [*VP* inspected *x*]

(40.2.1) [*S* [*NP* each engineer] [*VP* inspected [*NP* a house]]

(40.2.2) [*NP* a house]_{*x*} [*S* [*NP* each engineer] [*VP* inspected *x*]

Here, it appears that the first construal prohibits the noun phrase whose determiner is *some* from being assigned scope over its clause. However, we also know that a noun phrase whose determiner is *each*, like an indefinite noun phrases, is liable to two construals when it occurs within a negated verb phrase.

(41.0) Bill did not buy each car.

(41.1) [*NP* each car]_{*x*} [*Adv* not] [*S* Bill buy *x*]

(41.2) [*Adv* not] [*S* Bill buy [*NP* each car]]

On one construal, each car is such that Bill did not buy it, and on the other construal, it is not the case that Bill bought each car. In light of the fact that a noun phrase whose determiner is *each* may be assigned scope as in (41.1) above, the construal in (40.1.1) can easily be made to accommodate the hypothesis that a noun phrase whose determiner is *some* is obligatorily assigned scope over its clause, since the noun phrase whose determiner is *each* may be assigned scope over the clause which results from assigning the noun phrase whose determiner is *some* clausal scope.⁸ The construal in (40.1.1) then appears as:

(42) [*NP* each engineer]_{*x*} [*NP* some house]_{*y*} [*S* *x* [*VP* inspected *y*]]

3.3. Grammatical number

We now come to grammatical number. Grammatical number is more subtle than what was assumed in the formulation of the dilemma. To begin with, whereas singular means singular, plural does not necessarily mean plural. That is to say, while morphologically and syntactically, plurality is marked and singularity is unmarked, semantically, singularity is marked and plurality is unmarked. In other words, although the morpho-syntactic feature for singularity has no phonological

⁸ The reader conversant with the early work of Robert May will recognize this maneuver is the one used by him to maintain the obligatory status of his rule of quantifier raising.

representative, its sense is highly restrictive: it imposes singularity on the element with which it is associated. In contrast, the morpho-syntactic feature for plurality has a phonological representative, yet its sense is unrestrictive: it imposes no cardinality constraint on the element with which it is associated.

This latter claim runs counter to what was assumed in the formulation of our dilemma and what most of us take for granted. To be sure, a plurally marked noun is typically construed as denoting at least two items of which the noun is true. But such a construal is an implicature. After all, if it were not an implicature, sentences such as the following would express self-contradictions – which clearly they do not.

(43) Mark Twain and Samuel Clemens are the same person.

Nor is this example factitious, for it is precisely this point which is attested in actual usage. Consider the following sentence, taken from Norton Juster's *The Phantom Tollbooth* (p. 113), where the context is that a boy knocks on four different doors of the very same house, and the man answering one door looks just like each of the men answering the other three doors.

(44) I think you're all the same man.

Still further evidence that grammatically plural number noun phrases merely implicate, and do not entail, a denotation of cardinality greater than one comes from a puzzle addressed by Kamp and Reyle (1993, Chapters 4.1.6, 4.2.5). To see what the puzzle is, consider the following circumstance. Three students – say, Alexis, Evan, and Simon-Luc – buy books. Alexis buys one book, Evan buys two, and Simon-Luc buys three. Assuming that the only students in the domain of discourse are Alexis, Evan, and Simon-Luc, we ask the question: which of the following sentences expresses best the circumstance?

(45.1) Each student bought a book.

(45.2) Each student bought books.

(45.3) Each student bought two or more books.

The judgment is that the second sentence does. Notice, to begin with, that the last sentence cannot express the circumstance, since that sentence is unequivocally false with respect to it. Notice also that, although both of the first two sentences are judged true with regard to the circumstance, the first sentence is judged to be misleading, while the second sentence is not. This discrepancy is easily accommodated by the view that grammatical singularity is semantically marked for singularity whereas grammatical plurality is semantically unmarked.

A second subtlety of grammatical number is that plural noun phrases give rise to a flexibility of construal of their denotations with respect to the constituents

of which the plural noun phrases are arguments. As is well known, English plural noun phrases are susceptible of at least two different construals, identified as collective and distributive.

- (46.1) Bill and Reed left.
 Bill left and Reed left.
- (46.2) Bill and Reed met.
 *Bill met and Reed met.

The first sentence above is true because it is true to say of Bill that he left and it is true to say of Reed that he left: in other words, the predicate *left* distributes over the components of the subject. Note that this is not a syntactic rule, since the very same truth conditions would hold if the subject noun phrase were *the men* and its denotation were the set comprising Bill and Reed.

- (47.1) The men left.
- (47.2) The men met.

Here, there is no conjoined subject noun phrase over which the predicate might distribute. The difference lies in whether the predicate is true of the men severally – that is, whether or not it is true of Reed and true of Bill – or the predicate is true of the men collectively – that is, whether or not it is true of Reed and Bill together.

The choice between collective and distributive construals is not confined to the subject noun phrase position.

- (48) Rick drove through the redwoods.

On the more salient, collective construal, Rick drove among the redwoods. On the less salient, but equally available, distributive construal, Rick drove through each redwood tree. Indeed, the choice of construals arises at every argument position associated with a verb or a noun.⁹

Let us consider the semantic principles governing these construals. To simplify matters, we confine our attention to noun phrases comprising exactly one count noun and a determiner. Common nouns come with either the feature +PL or the feature –PL. This feature will apply both to the noun and to the noun phrase of which the noun is the head. How these features apply depends on the kind of determiner with which they occur.

We begin by considering the case where the determiner is either the definite article (*the*) or a demonstrative adjective (*this* or *that*). Associated with the head noun is the set of all objects in the domain of which it is true. If the noun is singular, then the set of objects associated with the entire noun phrase has exactly one member. If the noun is plural, then the set may have one or more objects, with

⁹ Gillon (1996) treats this point at length.

the implicature that it has more than one. Now, the relation expressed by the verb is not evaluated with respect to this set, but rather with respect to one or other aggregation built from the set.

What is an aggregation? It is a collection of aggregates. What I mean by the term 'aggregate' can be made clear by an example. Consider three men: Reed, Dan, and Paul. Each is an individual substance. They may form four distinct individual aggregates: Reed–Dan, Reed–Paul, Dan–Paul, and Reed–Dan–Paul.¹⁰ In addition, each man is himself an aggregate, the limiting cases of aggregates, so to speak. In all, seven distinct aggregates can be formed from Dan, Reed, and Paul. It should be stressed that aggregates such as Reed–Dan are not abstractions. They are as concrete as Reed and Dan. Aggregates such as Reed–Dan are sometimes called 'scattered objects'. Scattered objects are not exotic: after all, Indonesia is a scattered object, as was Pakistan up until 1971.¹¹

Now, an aggregation is a collection of aggregates where each aggregate is built from one or more objects in some background set and where no aggregate in the collection is a subaggregate of another. The following are aggregations with respect to the background set of Reed, Dan, and Paul. {Reed, Dan, Paul}, {Reed–Dan, Paul}, {Reed–Paul, Dan–Paul}, and {Reed–Dan–Paul}.¹²

Let us see how these ideas apply to yield a semantic interpretation for the sentence below.

(49) The men bought the houses.

Suppose that *man* denotes the set {Reed, Dan, Paul} and that *house* denotes the set $\{h, k\}$. Suppose further that Reed and Dan purchased house *h* and Reed and Paul purchase house *k*. Then the sentence in (49) is true with respect to the aggregation of {Reed–Dan, Reed–Paul} for the subject noun phrase and the aggregation $\{h, k\}$ for the object noun phrase.

The semantic principles for quantified noun phrases are somewhat different from those for demonstrative and definite noun phrases. As with definite and demonstrative noun phrases, a denotation is associated with the noun which is the head of the phrase. If the noun phrase is singular, the quantifier which is the determiner of the noun phrase must range over the aggregation formed from the denotation of the head noun each of whose members is a simple, or minimal, aggregate. If the noun phrase is plural, the quantifier of the noun phrase may range over any aggregation.

¹⁰ The order of the elements in the complex name does not matter. Reed–Dan is the very same individual as Dan–Reed.

¹¹ In 1971, what had been called East Pakistan became what is now called Bangladesh.

¹² For more technical details, see (Gillon, 1992).

3.4. Indefinite noun phrases

We have observed above that an indefinite noun phrase and the very same noun phrase except that the indefinite article is replaced by the determiner *some* manifest similarities and dissimilarities. On the one hand, the common noun phrase complement of any linking verb taking a noun phrase complement must be an indefinite noun phrase. On the other hand, the common noun phrase complement of any non-linking verb taking a noun phrase complement may be either indefinite or the very same noun phrase except that the indefinite article is replaced by the determiner *some*, while they exhibit the same scope construals with respect to noun phrases with the determiners *each* – among others – they exhibit different scope construals with respect to the adverb *not*.

How, then, are indefinite noun phrases to be understood as complements the verb *to be*? To answer this question, we should bear in mind two things: First, each English clause requires a verb. Second, it is preferable to interpret similar structures in similar ways. Now consider the sentences below:

(50.1) Bill left.

(50.2) Bill is handsome.

(50.3) Bill is a student.

The usual semantic analysis of the first sentence in (50) is that it is true just in case the denotation of *Bill* is a member of the denotation of *left*, that is, the set of things which have left. By parity of reasoning, the second sentence in (50) is true just in case the denotation of *Bill* is a member of the denotation of the verb phrase *is handsome*, and the third sentence is true just in case the denotation of *Bill* is a member of the denotation of the verb phrase *is a man*. The question arises: can the denotation of the complex verb phrases be determined on the basis of denotations assigned to their parts in a way that respects the *prima facie* structure and the *prima facie* meaning of *to be* and the indefinite article? The answer is yes. Letting the verb *to be* denote the identity relation and letting the indefinite article have the interpretation of the existential quantifier of classical quantificational logic, one analyzes the sentences in (50) as follows:

(51.1) $Den(Bill) \in Den(left)$

(51.2) $Den(Bill) \in \{x: \langle x, y \rangle \in Den(is) \text{ for some } y \in Den(handsome)\}$

(51.3) $Den(Bill) \in \{x: \langle x, y \rangle \in Den(is) \text{ for some } y \in Den(man)\}$

The semantic analysis of grammatical plurality outlined above supplements the foregoing naturally to yield a semantic analysis of clauses whose subjects are definite plural noun phrases. To see how, consider the following plural versions of the sentences in (50):

- (52.1) The men left.
 (52.2) The men are handsome.
 (52.3) The men are students.

Recall that predicates of plural definite and demonstrative noun phrases are evaluated, not with respect to their denotation, but with respect to an aggregation of their denotation. Thus, each sentence above is true with respect to an aggregation associated with its subject noun phrase just in case the predicate *left* is true of each member in the aggregation. Let A be the relevant aggregation. Then, the following are the truth-conditions for the sentences relative to the association of aggregation A to the subject noun phrase.

- (53.1) For each $x \in A$, $x \in \text{Den}(\text{left})$
 (53.2) For each $x \in A$, $x \in \{x: \langle x, y \rangle \in \text{Den}(\text{is}), \text{ for some } y \in \text{Den}(\text{handsome})\}$
 (53.3) For each $x \in A$, $x \in \{x: \langle x, y \rangle \in \text{Den}(\text{is}), \text{ for some } y \in \text{Den}(\text{man})\}$

Finally, let us consider three sentences in which the main verb is not a linking verb.

- (54.1) The girls saw Evan.
 (54.2) The girls saw a boy.
 (54.3) The girls saw some boy.

The same principles of interpretation apply here. Letting G be the aggregation associated with the subject noun phrase, one obtains the following truth conditions:

- (55.1) For each $x \in G$, $x \in \{x: \langle s, e \rangle \in \text{Den}(\text{saw})\}$
 (where e is the denotation of *Evan*)
 (55.2) For each $x \in A$, $x \in \{x: \langle x, y \rangle \in \text{Den}(\text{saw}), \text{ for some } y \in \text{Den}(\text{boy})\}$
 (55.3) There is some $y \in \text{Den}(\text{boy})$ such that, for each $x \in A$,
 $x \in \{x: \langle x, y \rangle \in \text{Den}(\text{saw})\}$

We are, at last, in a position to address the dilemma set out at the beginning of the paper. Let us first consider the singular sentences discussed in (1)–(3), repeated here for convenience:

- (1.1) The men bought a house.
 (2.1) A house was bought by the men.
 (3.1) The men bought some house.

The first sentence is liable to being true both when there are different houses for different men and when there is only one house, though there are several men. This follows from the observation made above that indefinite noun phrase may or may not be assigned clausal scope. In the latter case, it remains in place and the rule of VP evaluation evaluates the predicate with respect to each member of some aggregation for the subject noun phrase. In the former case, it takes clausal scope thereby requiring its value to be fixed before the predicate is evaluated with respect to a given aggregation for the subject noun phrase. This construal is the same as the only one available for the third sentence, since, as we saw, noun phrases whose determiner is *some* must be assigned clausal scope. Finally, this very same construal is also the only one available for the second sentence since, the noun phrase in the subject noun phrase position automatically has scope over its accompanying verb phrase.

We now turn to the plural sentences in (1)–(3).

- (1.2) The men bought houses.
- (2.2) Houses were bought by the men.
- (3.2) The men bought some houses.

As in case of the first sentence above, the indefinite noun phrase may or may not be assigned clausal scope. In the latter case, it remains in place and the rule of VP evaluation evaluates the predicate with respect to each member of some aggregation for the subject noun phrase. In the former case, it takes clausal scope thereby requiring its value to be fixed before the predicate is evaluated with respect to a given aggregation for the subject noun phrase.

Finally, it should be clear that sentences with noun phrases which begin with cardinal numerals, such as those in (16), repeated here,

- (16.1) The men bought two houses.
- (16.2) Two houses were bought by the men.

fall within the purview of the principles outlined above.

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CHAPTER 6

Towards a Model of Situated Discourse Analysis*

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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*One needs to look near at hand if one wants to study men;
but to study man one must learn to look from afar.*
(Rousseau)

1. Introduction

This paper attempts to present a synthesis of a decade's attempt, with vivid memories of perennial frustrations, to come to terms with the actual use of language by actual people doing actual things with language in actual social situations. It may sound quite naive to a layman's ear, for to him this is what language is, and there is no need to make fuss about it. To a conservative linguist, it is either an ill-conceived research project unworthy of a penny or something hopelessly messy and unfeasible. It is a synthesis because it is based on some already published papers as well as unpublished conference manuscripts (see references). The theme it attempts to advance is the view of the actual use of language as goal-directed social process, complementing the views of the actual use of language as being mostly grammatically irrelevant, as the heterogeneous instantiation of the language system, as the instantiation of the language system in communication, as action, as a product of social order and organization, and as a generating force of ongoing social interaction. It is in the general tradition of functionalism, including pragmatics, discourse analysis, conversation analysis, systemic linguistics (particularly Halliday's works, 1973, 1978, 1994; Halliday and Hasan, 1989) and sociolinguistics. However, its emphasis on the theory construction from the perspective of an actual user, on being "situated" and "actual", as shown below, will earn its own identity and at the same time invites challenges and difficulties.

In what follows, we first deal with the problems associated with "actual use". Then an outline of situated discourse analysis is given. Finally we examine this research programme in its current academic context, pointing out some of its theoretical implications.

2. Approaches to the actual use: a review

2.1. *The actual use: from irrelevance to legitimacy*

To start with, let us spell out some potential interpretations of what can be meant by the term "actual use". It is in fact used to cover a scale of phenomena that can be represented, for the sake of easy cross-reference, by the following four signposts.

(1) All the spontaneous talks by all the adult native users of a given language for a particular period of time across all the social situations – to be referred to as the *comprehensive-all use*.

(2) All the spontaneous talks by all the adult native users of a given language at a particular time (an hour, a day, a week, a year, or even a longer period of years) in one particular social situation – as the *sample-all use*.

(3) Some talks by two or more adult native users of a given language for a particular period of time in all social situations – as the *comprehensive-some use*.

(4) Some talks by two or more adult native users of a given language at a particular time (an hour or so) in some social situations – as the *sample-some use*.

These four cases can of course be further fine-tuned, but they suffice for the review of the following stances on the actual use, namely:

- (1) as being mostly grammatically irrelevant,
- (2) as the heterogeneous instantiation of the language system,
- (3) as the instantiation of the language system in communication,
- (4) as action,
- (5) as a product of social order and organization,
- (6) as a generating force of ongoing social interaction.

Let us examine these positions one by one.

The actual use as being mostly grammatically irrelevant

As we know, Chomsky draws a distinction between competence, i.e., linguistic knowledge, and performance, i.e., the actual use. To him, it is linguistic knowledge that constitutes the proper object of linguistic inquiry, and performance should be filtered out.

Linguistic theory is concerned primarily with an ideal speaker-listener... unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance.

(Chomsky, 1965, p. 3)

Note that his “ideal speaker–listener” is not a reconstruction on the data obtained after investigating all the actual native users of a given language. A closer look will show it is the innate language faculty that counts. But how can the linguistic knowledge lodged in the innate language faculty be assessed, if not by the evidence given in the performance? This actually lands up in a paradox (Wardhaugh, 1993, p. 168):

Linguists generally prefer to investigate those aspects of language to which all the members of a group have access rather than the idiosyncrasies of the speech of individuals. The *general* rather than the *particular* has claimed their attention. One consequence is a kind of paradox: *linguists usually attempt to describe the language system all speakers of a language presumably share by using data they gather from very few speakers – sometimes even only a single individual* – and they do not attempt from many individuals. (italics mine)

Even the “data from very few speakers” or from “a single individual” are not the actual use (in the sample-some sense above), because the features characteristic of actual performance have to be filtered out. As a result, “the language has to be so idealized that it bears little relation to what people actually write – and still less to what they actually say.”

(Halliday, 1994, p. xxiii)

The actual use as the heterogeneous instantiation of the language system

The actual use of language is labeled by Saussure as parole. Since parole is seen as the instantiation of the system of language, viz. langue, the actual use Saussure seemed to have in mind is in the comprehensive-all sense. It is however condemned as being heterogeneous and messy. A lot of things which are intrinsic to parole thus have to be filtered out in order to reveal the true colour of langue, which was believed to be the object of linguistic science proper. Such an effort proved to be fruitful at the levels of phonology and morphology, since a more or less complete picture of the underlying systems with regard to these two levels can be constructed after investigating a limited range of the actual use, that is, the sample-some data could be adequate. It became problematic with syntax, and hopeless with semantics. Pragmatics, and discourse analysis were virtually inconceivable, since these two, being much less abstract and close to parole, resist excessive abstraction and idealization.

The actual use as the instantiation of the language system in communication

There are two significant variations, represented by Hymes and Halliday, respectively. Hymes (1974) accepted the existence of an abstract language system in the Chomskyan sense. The actual use is the instantiation of such a system in communication. It is however not regarded as being irrelevant, as with Chomsky, nor heterogeneous, as with Saussure. To Hymes, it is actually richer than the underlying abstract system, hence the need for the notion of communicative competence. Consequently the notion of language user becomes richer too. Hymes' user is an adult communicatively competent in all social situations, and his theory was meant to account for the actual use in the comprehensive-all sense, in spite of the fact that his data used to build the theory were the actual use in the sample-some sense.

Although Halliday also accepts the actual use (i.e., speech or spoken text in his terminology) as the instantiation of the language system, his definition of the latter is different from the previously reviewed linguists. He places a greater emphasis on the paradigmatic principle of language, i.e., language as systems of choice than on the syntagmatic principle of language, i.e., language as syntax. His treatment of text (both spoken and written) is also different. He observes (Halliday, 1994, p. xxii):

We follow Saussure in his understanding of the relationship between the system of language and its instantiation in acts of speaking; although not in his implied

conclusion, that once the text has been used as evidence for the system it can be dispensed with – it has served its purpose. This mistake (whether due to Saussure or to his interpreters) haunted linguistics for much of the twentieth century, making it obsessed with the system at the expense of the text – and hence provoking the present swing of the pendulum in the opposite direction.

The text, as Halliday points out later, is regarded as a legitimate object of inquiry itself along the language system by linguists of the main European functional 'schools'. He writes (1994, p. xxii):

Their view would be that one cannot really understand the one without the other. It is of little use having an elegant theory of the system if it cannot account for how the system engenders text; equally, it adds little to expatiate on a text if one cannot relate it to the system that lies behind it, since anyone understanding the text does so only because they know the system.

There are several fundamental relations this quote touches upon:

(1) The text-system relation: Texts, spoken and written, are instantiations of the language system.

(2) The system-text relation: The system engenders text.

(3) The theory-system-text relation: A theory is about the system, and it expatiates on a text by relating it to the system.

I shall come back to these relations later (see Section 5 below). Although both Hymes and Halliday regard the actual use as a legitimate object of inquiry, their focus of attention is different. Hymes's theory of ethnography of communication is more concerned with the actual use as a cultural and communicative event. Halliday is more interested in applying his theory of functional grammar to discourse analysis, as this quote clearly shows:

Discourse analysis has to be founded on a study of the system of the language. At the same time, the main reason for studying the system is to throw light on discourse – on what people say and write and listen to and read. Both system and text have to be in focus of attention. Otherwise there is no way of comparing one text with another, or with what it might itself have been but was not. And, perhaps most important of all, only by starting from the system can we see the text in its aspect as a process.

(Halliday, 1994, p. xxii)

The actual use as action

The actual use as action draws our attention to the fact that people do things with language. There are two models, the language game model of Wittgenstein (1958) and the speech act model of Austin (1962) and Searle (1969, 1979, 1983). Wittgenstein conceptualized it in terms of language activities, i.e., social interactions, whereas Austin and Searle started from single utterances. Wittgenstein and Austin as philosophers seemed to have no commitment to any specific linguistic

thinking, whereas Searle is more or less influenced by the Chomskyan paradigm (see Streeck, 1980). As this theme is mostly relevant to the present study, a more detailed review is postponed until Section 2.2 below.

The actual use as a product of social order and organization

The most noticeable research under this heading is conversation analysis initiated by sociologists or anthropologists. It focuses on discovering the “machinery” of conversational turn-taking, structural organizations such as managing overlap, repair, topic shift, the use of discourse markers, fillers, and so on. Recently the analytic framework is extended to institutional discourse (Drew and Heritage, 1992; Boden, 1994). Unlike the linguists reviewed so far, their analysis of the machinery of conversation is conducted as a part of a broader endeavor of uncovering how social order and organization are achieved and maintained. In other words, they have little linguistic commitment, as linguists do. In a similar fashion, when linguists join CA sociologists or anthropologists in conversation analysis, they are less interested in uncovering social order than in throwing light on linguistic problems (see further discussion Section 2.2 below).

The actual use as a generating force of ongoing social interaction

The view of the actual use as a generating force of ongoing social interaction can be regarded as the latest trend in discourse analysis (e.g., Boden and Zimmerman, 1991; Boden, 1994). Discourse analysis (DA in short hereafter), in comparison with CA, is more versatile and divergent with regard to research backgrounds, objectives and methodologies. It seems that any analysis that goes beyond a single sentence or utterance can be labeled as DA. In this broad sense, DA embraces CA. DA can be assessed on a continuum of four research orientations: (1) from discourse to sentence/utterance with the objective of seeking discourse explanations of grammatical difficulties; (2) from sentence/utterance to discourse with the objective of analyzing intrinsic discourse structures; (3) from discourse to society with the objective of using DA as a tool to understand social issues (e.g., critical discourse analysis); and (4) discourse and society being integrated in the sense that each depends on the other for existence (see (Gu, 1997a) for detailed discussion of these orientations; for the assessment of discourse analysis in general, see, e.g., (van Dijk, 1985, 1997a, 1997b; Schiffrin, 1994)).

2.2. Some reservations

The six stances on the actual use outlined above confirm Halliday’s observation that the present swing of the linguistic pendulum is in the direction of the actual use. The six can also be seen as an uneven path from the most abstract innate language faculty, to the “abstract objectivism” of language¹, to the dual recognition

¹ Volosinov’s description of Saussure’s theory of language (1973, p. 21).

of both the abstract system and its instantiation in the actual use, to the diversified discourse analysis with or without invoking any theory of the abstract system. Conversation or discourse analysis by sociologists and anthropologists can be regarded as being abstract-system free, whereas those by some linguists as abstract-system bound. For example, Ventola's (1987) study of service encounters, Eggins and Slade (1997)'s analysis of casual conversation, are carried in the general framework of systemic linguistics.

The actual use of language itself is a very complex phenomenon. I have laid four signposts: the comprehensive-all, the sample-all, the comprehensive-some, and the sample-some. Researchers are more motivated in developing a theory or approach that can accommodate the comprehensive-all (even including written language) than a theory or approach that can cater for other less comprehensive ones. The researches on the interfaces between language and society, for example, between language and power (Lakoff, 1990; Fairclough, 1989), language and ideology (Hodge and Kress, 1992) and language and gender (Crawford, 1995; Wodak, 1989, 1997), are all about language use, but are very general in the sense that they are not meant to account for how individual language users use language. It is a sort of generic user with a particular social parameter that is accommodated.

In sum, the studies of language have been carried out either in terms of functions that language serves, thus bypassing the language user, or in terms of a particular social parameter the generic user possesses. This is the first point with which the present paper parts company. The actual use of language is investigated by examining the way actual users use language to attain communicative and extra-communicative goals in real life social situations, with a full recognition of actual users as discourse developers/managers.

Such an empirical approach is a natural move towards a full merger of language use as action with social interaction at large. The mainstream pragmatics, with its vowed claim on the study of language use as its disciplinary hallmark, has consistently shunted away from this direction. As we may recall, Austin (1962, p. 147) observes: "the total speech act in the total speech situation is the *only actual* phenomenon which, in the last resort, we are engaged in elucidating" (emphasis original). Against this advice, the perlocutionary act, part and parcel of a total speech act, is expelled by some leading pragmatics from the domain of linguistic pragmatics, on the ground that perlocutionary phenomenon goes beyond linguistic communication (e.g., van Dijk (1977, p. 198),² Bach and Harnish (1979, p. 16), Leech (1983, p. 203)). Searle's view that illocutionary intention is reflexive, whereas perlocutionary intention is not is universally endorsed. Similarly his view that illocutionary acts are the basic units of communication seems to be taken for granted by the majority of pragmatics researchers. The Gricean intention, on the other hand, which, according to

² This is van Dijk's early position. It seems that he has not changed this in later works on discourse. However, he regards linguistic pragmatics as a "subdiscipline of discourse studies" (1997a, p. 14). He places perlocutionary phenomenon in the domain of discourse, as I do here.

Strawson (1964) and Schiffer (1972), is actually equivalent to Austin's perlocutionary intention, is modified and rephrased into communicative intention, e.g., informative intention in Sperber and Wilson (1986, pp. 28–29). The purge of perlocutionary phenomenon from the domain of pragmatics prevents it from moving further into the domain of actual discourse (see (Gu, 1993a, 1993b) for detailed review and critique; see also Searle, 1986), i.e., a step away from the actual use of language (see later). Recent publications in the mainstream pragmatics continues reinforcing the position of confining linguistic pragmatics to linguistic communication (e.g., Blackmore, 1992; Thomas, 1995; Grundy, 1995). Mey (1993) has a chapter on “societal pragmatics”, which reads like an afterthought.

A closer look at linguistic communication will soon reveal that it is not equal to the actual use of language. First, the actual use of language is situated discourse, which is infiltrated with perlocutionary considerations. In other words, the actual use is an intrinsic part of social interaction, whereas linguistic communication is a domain abstracted by pragmatists for their own theoretical purposes. In this connection Habermas's theory of universal pragmatics is quite revealing. Habermas (1976, 1984) joins linguists by embarking on developing a universal pragmatics. He upholds the distinction between illocutionary intention and perlocutionary purpose. Like linguists/pragmatists, he confines his universal pragmatics to linguistic communication: “I count as communicative action those linguistically mediated interactions in which all participants pursue illocutionary aims, and *only* illocutionary aims, with their mediating acts of communication” (italics in original) (1984, p. 295). However, he (1984, p. 101) points out:

To avoid misunderstanding I would like to repeat that the communicative model of action *does not equate action with communication*. Language is a medium of communication that serves understanding, whereas actors, in coming to an understanding with one another so as to coordinate their actions, *pursue their particular aims*. In this respect the teleological structure is fundamental to all concepts of action. (emphasis mine)

His “particular aims” are what we propose to call extra-communicative goals (i.e., perlocutionary purpose). From the perspective language users, they pursue their extra-communicative goals through linguistic communication. In other words, discourse includes linguistic communication, but goes beyond it.

Extra-communicative goals are discourse-based. They are what particular discourses are about. They are however generally neglected by CA or DA analysts. The “machinery” such as turn-taking, managing overlap, repair, topic shift, the use of discourse markers, fillers, and so on are no doubt important in their own right, but they are more like the structure (if we may use this word appropriately here) of discourse than its content.

2.3. The actual use as goal-directed social process

The view of the actual use of language as goal-directed social process is to study how actual users use language in pursuit of extra-communicative goals. An immediate difficulty one faces is that extra-communicative goals are more individual-specific than the issue of meaning in communication which can be generalized in terms of general speaker and hearer. Halliday (1978, p. 28) makes a similar observation thus:

When we come to examine the adult language in its contexts of use, ... [t]he speaker was in fact using language in a number of different ways, for a variety of different purposes, all at the same time. Then when we came to consider actual instances we should have to recognize that in any particular utterance the speaker was in fact using language in a number of different ways, for a variety of different purposes, all at the same time.

This diversity and complexity is a distinctive feature of the actual use of language. The established way of approaching it is either to idealize it or talk about it in terms of functions language serves. It is no longer a problem, however, if the objective of investigation is not to reach a grandiose theory with a claim of universality, but to capture the richness instead of seeing it as something messy. The actual use of language is many times richer than the underlying abstract system. The model to be outlined below is an attempt to cope with diversity and complexity rather than an effort towards a general theory that will idealize away all the actual richness.

3. The object of inquiry: features of situated discourse

3.1. Basic assumptions

We share some fundamental assumptions with Halliday's theory of language as social semiotic.

- Language evolves through things language users do with it in various modes of social interactions. It is the uses of language that have moulded the shape of language
- Language is being regarded as the encoding of a 'behaviour potential' into a 'meaning potential'; that is, as a means of expressing what the human organism 'can do', in interaction with other human organisms, by turning it into what he 'can mean'. What he can mean (the semantic system) is, in turn, encoded into what he 'can say' (the lexicogrammatical system, or grammar and vocabulary); ... (Halliday, 1978, p. 21)

As pointed out above, we differ from Halliday in that we are primarily concerned with what language users actually do with language rather than with what they can do with language. Situated discourse analysis provides a reconstructive account,

i.e., know-that knowledge, of the actual use of language, i.e., know-how skill of ordinary language users. In Halliday's framework, situated discourse analysis is a bridge linking the actual use with language as behaviour potential, as meaning potential, and as speech potential.³

3.2. *The object of inquiry: features of situated discourse*

The object of inquiry of situated discourse analysis is situated discourse, a social process involving two or more acting and talking persons doing things with language together. It is assumed that a social process like this is purposeful, hence goal-directed. It can be demonstrated by the following event that actually took place in Beijing in 1995, the talking part of which was audio-taped. There were five people engaged in the episode:

Joe: female, deputy director, former classmate of Jin

Jin: male, senior aide of Zhuang

Zhuang: male, an official of rank 3, Lin's father

Lin: female, Zhuang's daughter, just quit her job

Tan: male, Joe's assistant, a coordinator of a training course

The situated discourse started when Jin and Lin went and talked with Joe and Tan. It can be summarized as follows:

Lin, Zhuang's daughter, would like to join a training class at a training centre. The registration date had long expired, and there was no vacancy left. Jin, an ex-staff of the centre, Zhuang's senior aide, knew Lin's wish and volunteered to help. Jin took Lin to see Joe, the deputy director of the centre, who was Jin's old friend. After a lengthy talk, Joe asked his inferior Tan, the centre's course coordinator, to find a place, by whatever means, for Lin, and at the minimum charge.

Lin's goal that she wanted to join Tan's training course set the discourse going and gave it a character. Although Zhang did not take part in the actual talking, he was also engaged in the sense that he affected the way the talking parties handled the goal negotiation process by virtue of his social position.

Situated discourse is like a multiple-layered snowball, starting from a triggering goal (e.g., Lin's goal above) and gathering pace and momentum as talk exchanges are carried on. It is a dynamic social process as defined by Elias (1970, p. 85, *italics original*. Quoted from Mennell, 1974, p. 83):

³ The notion of reconstructive account has its theoretical root to Habermas' theory of universal pragmatics (Habermas, 1976, p. 1984). We inherit his thesis of "reconstructive sciences".

... each player's general strategy in the game and his every move will be increasingly dependent on the changing figuration of the game process. The character of the game will change, gradually ceasing to be the accomplishment of an individual plan and becoming a social process. ... a game process *which neither of the two people has planned*.

Elias' model of social process is quite revealing, provided that his game analogy is not taken too literally. The task of a situated discourse analyst is to reconstruct a know-that account on the basis of the social process by know-how performers.

Situated discourse like the one above has the ensuing features of being situated:

- (1) It is situated to an actual social situation;
- (2) It is situated to actual users;
- (3) It is situated to an intersubjective world of discourse;
- (4) It is situated to actual goals;
- (5) It is situated to spatial and temporal setting;
- (6) It is situated to the cognitive capacity of actual users;
- (7) It is situated to performance contingencies of actual users.

The seven features are not mutually exclusive or meant to be exhaustive. They are highlights which are believed to be important for a reconstructive account of situated discourse to consider carefully.

It is situated to an actual social situation

A situated discourse can be seen as a token of Levinson's "activity type", i.e., "a culturally recognized activity", "a fuzzy category whose focal members are goal-defined, socially constituted, bounded, events with *constraints* on participants, setting, and so on, but above all on the kinds of allowable contributions"⁴ (1992, p. 69; italics original). Levinson here emphasizes the normal force a culture or society exerts on participants. Since we are interested in actual discourses, whether such normative force has any effect on the actual individual participants in question is subject to the orientation they adopt under particular circumstances. Situated discourse involves an intersubjective world that is jointly defined and lived by actual participants, who may (or may not) orient themselves towards social-cultural norms, and at the same time conduct their life business with their own characteristics. Participants' norm orientation and the way they pursue their goals can be congruous and can also be conflictive. Most of doctor-patient interactions analyzed in Gu (1996a) are congruous, whereas discourses conducted to attain goals through *guanxi* (backdoor practice) are norm-conflictive, which gives rise to a considerable amount of tension and anxiety among the participants (Gu, 1995). So a situated discourse is a token of an activity type always with its characteristics.

⁴ We regard Levinson's activity type as part of social situation understood in the sense of Argyle et al. (1981). It is narrower in extension than the latter.

It is situated to actual users

As shown in Section 2 above, the notion of language user varies from one paradigm to another. However, it has remained an abstract construct with differences only in the emphasis on certain particular aspects: e.g., Chomsky on the mind, Hymes and Halliday on the social and cultural (i.e., “social man” in Halliday’s term), others on the political, the ideological, and gender. In pragmatics, Mey (1993, p. 30) holds that ‘One of the factors that have been instrumental in shaping modern pragmatics is the renewed interest in the users of language, as compared to language as a system, language in the abstract.’ But who are the language users that pragmatists are interested in? In Austin’s (1962) speech act theory, we can detect a much broader notion of language user than that in Searle’s (1969, 1979, 1984). Austin emphasizes the social role of language user in successfully performing a speech act whereas Searle allows the performer’s mental states and his intentionality to play a decisive role in speech act classification. In the mainstream pragmatics, the language user is a linguistic communicator performing illocutionary acts. For some specific purposes we meet a particular language user construct. For example, Brown and Levinson (1987, p. 58) develop their theory on a two-faced model man.

We attempt to account for some systematic aspects of language usage by constructing, tongue in cheek, a Model Person. All our Model Person (MP) consists in is a willful fluent speaker of a natural language, further endowed with two special properties – rationality and face . . .

With this cardboard figure we then begin to play: How would such a being use language? . . .

It is Goffman who made consistent efforts to “foot” the notion of language user to a more grass-root level (Goffman, 1981; Levinson, 1988; Clark and Carlson, 1982; Gu, 1997b).

This paper adopts Habermas’s conception of the language user as an acting and speaking subject, which is succinctly captured by McCarthy (1978, p. 291) that deserves being quoted in full:

Inasmuch as normal interaction involves regarding the other as a subject, it involves supposing that he knows what he is doing and why he is doing it, that he intentionally holds the beliefs and pursues the ends that he does, and that he is capable of supporting them with reasons if necessary. Although this “supposition of responsibility” is frequently (perhaps even usually) counterfactual, it is of fundamental significance for the structure of human relations that we proceed as if it were the case: “on this unavoidable fiction rests the humanity of intercourse among men who are still men.”

(McCarthy, 1978, p. 291)

The language user as a responsible subject is the basic assumption we make in approaching an actual user. Specifically, he has two potentials (borrowing this term from Halliday) to tap in producing a situated discourse: language potential

and social potential. Language potential refers to his knowledge of language as systems of choices, and social potential his resources derived from his social role, status, reputation, expertise, and so on. These two potentials are tapped in pursuit of communicative and extra-communicative goals (i.e., he “pursues the ends he does”).

It is situated to an intersubjective world

Situated discourse generates an intersubjective world. It consists of the activated resources from all the potentials of the participants. Goals provide points of relevance for what to be activated. As more goals are presented for negotiation, more potential resources are activated, thus making the intersubjective world richer and more complicated. An intersubjective world is not a fixed entity. Rather it develops as discourse unfolds. It is, therefore, constantly being updated by the ongoing process of communication and goal attainment pursued by participants.

The intersubjective world of situated discourse, on the insights from Givón (1989, p. 8), can be analyzed in terms of knowledge.

(1) Knowledge of a responsible subject

The knowledge is activated concerning the other as a responsible subject, and concerning social and personal relations among all participants. This knowledge is subject to being updated, as the relations are renewed or challenged or strengthened during the course of discourse development.

(2) Knowledge of spatial and temporal setting

The knowledge is generated by interactants by virtue of being together on the same scene at the same time of the immediate talk situation. This knowledge enables interactants to have access to the shared reference for deixis.

(3) Knowledge of situational goals and extra-communicative goals

The knowledge is activated of the stereotyped goals associated with the activity type or social situation. It provides an initial frame for the extra-communicative goals to be understood, assessed, and pursued.

(4) Knowledge of linguistic communication

The knowledge for linguistic communication is activated to serve the purpose of goal attainment. The knowledge of language as systems of choices is particularly relevant here. Its effective use is subject to the cognitive conditions of participants under the circumstances. In other words, the actual discourse is not necessarily ideal. It could have been improved, or it has turned out to be better than expected due to exceptional improvisation.

(5) Knowledge of discourse process

The knowledge of what is said before is generated and constantly updated.

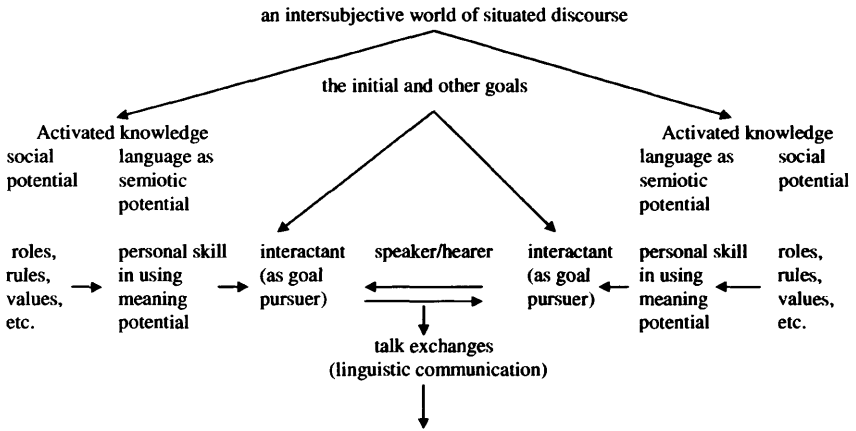


Fig. 1. Situated discourse as a joint purposeful social process.

(6) Resources related to linguistic and extra-communicative goals

Linguistic and extra-communicative goals activate specific resources such as special knowledge, schemata, beliefs, values, etc.

An intersubjective world of situated discourse can be graphically represented as above (see Figure 1).

The initial and other goals capture our general understanding of situated discourse as a joint purposeful social process, and generate a running theme of coherence and relevance. Acting and talking goal pursuers (i.e., responsible subjects) exercise their skill in using language as semiotic potential by making choices and in invoking their social potential by exercising their roles, orientation towards rules and norms, special knowledge, etc. As a result an intersubjective world of situated discourse is formed, and a piece of social-discoursal reality is realized, no matter how short-lived it may be.

3.2.1. It is situated to actual goals

As we know it, the notion of goal has a long and perhaps troubled history in philosophy, and teleology in particular (see, e.g., Taylor, 1980; Woodfield, 1976). Schank and Abelson (1977) incorporate it in their AI research. In pragmatics, Parisi and Castelfranchi (1981) embark on "a goal analysis of some pragmatic aspects of language". Leech (1983) finds "it useful to talk of a goal or *function* of an utterance, in preference to talking about its *intended* meaning..." (*italics original*). Gu (1987, 1993a, 1993b), following Leech, uses it to tackle "the impasse of perlocution". In sociology, it is used by some sociologists as a defining feature of organization (see, e.g., Haralambos, 1985, p. 278). Argyle et al. (1981) regard it as

a characteristic of social situations. Pervin (1986) held that individual behavior in situations should be studied in a theoretical frame of goals. He argued that the individual's choice of situations and behavior was mainly directed towards obtaining goals. It is also seen in Levinson's definition of activity type (see the quote above). In discourse analysis, Tracy and Coupland (1990, p. 2) edit a monograph of papers

that share two common features: (1) a recognition of the intertwined nature of 'goal' and 'discourse'; and (2) a recognition that people typically have more than one goal when they talk with others. It is essential, we argue, that goals and discourse be conceived of as intertwined concepts: if talk is conceived as essentially a mode of action then these actions will often be taken in the pursuance of 'objective', however imprecisely formulated or formulatable. Correspondingly if we assume that people approach many social episodes with specific designs, ambitions, wishes – probably also misgivings and avoidances – then it seems natural to look at talk as at least a potential goal fulfillment mechanism.

Gu (1995, 1996a, 1996b, 1997a), unfortunately being unaware of Tracy and Coupland's monograph, adopts a similar line by treating backdoor practice, doctor–patient interaction, and nurse–patient interaction as goal-directed discourse. In communication studies, Dillard (1990), Smith et al. (1990), Cody, Canary and Smith (1994) present impressive studies on goals in tactical communication, and compliance-gaining communication in particular.

The notion of goal is part of ordinary language in making sense of someone's behaviour. As a theoretical construct, it has its difficulties and disagreements as no theoretical constructs are free from such illnesses. Its usefulness, as indicated by the brief review just now, is increasingly being recognized. Surely in everyday language, apart from using "goal", people also use "motive", "purpose", or "end" to talk about somebody's or their own action. This serves as an empirical basis for the technical use of it.

As a working definition a goal is a state of affairs that is consciously or unconsciously desired by an individual. S/he consciously possesses the goal when it is given a mental representation. The attitude towards one's goal shows goal commitment. S/he may have many goals at a time. However, to some s/he may have a strong goal commitment, whereas to others s/he may take "don't-mind-much" attitude, hence a very weak goal commitment.

Goals fall into goal relations with one another, thus forming a hierarchical structure, both intra-personally and interpersonally. There are four general goal relations: common, collaborative, independent, and conflictive, as graphically shown in Figure 2.

In situated discourse, we first distinguish two super-goals: the communicative and extra-communicative goals. The communicative goal is the goal of getting the message across. The extra-communicative goal is the goal that participants hope to achieve via discourse. When we come to a specific situated discourse, the two goals are given a specific content. The communicative goal will be associated with

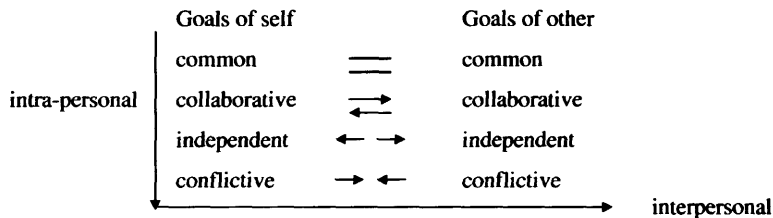


Fig. 2.

illocutionary acts, whereas the extra-communicative goal with the purpose of the whole interaction. The communicative goal is a means to the attainment of the extra-communicative goal.

Situated discourse analysis is primarily concerned with extra-communicative goals that are presented by participants to the intersubjective world of discourse for negotiation and potential settlement. Some of them will be identical with institutional or organizational goals, or with the goals that are intrinsic to an activity type. For example, the goals pursued by doctors and patients in clinic consultation are normally identical with the institutional goals that are characteristic of a hospital. We can therefore characterize participants' goals as institutionalized goals, job-related goals, and so on. They can of course pursue goals that are incongruous with the social situation or the activity type, as the case with backdoor discourse.

With regard to action in general, goals offer "culturally viable explanations for behavior", and they "are used to partition the stream of behavior into meaningful units" (Dillard, 1990, pp. 72–73). In case of situated discourse, extra-communicative goals seem to have similar functions. Discourse sequence can be segmented into coherent chunks in terms of stages of goal attainment (see Gu (1996b) for details). Extra-communicative goals can also provide a coherent link between discourses. For instance, in my investigation of backdoor discourse, there was a case involving a series of discourses – face-to-face talks, written letters, and telephone conversations – that took place sporadically for six months. Each of the discourses had its own features, of course, since they involved different interactants, however, they were all connected by the running theme, namely to attain a particular extra-communicative goal (see Gu, 1995).

Finally, goal attainment through situated discourse is interpersonal in nature, and it involves one participant's adoption of another's goal. It is a form of social cooperation achieved through linguistic communication. This can be demonstrated with the following exchange that took place in a student's kitchen.

- A: Have you got some vinegar? The Spar's closed.
- B: Yes, here you are. (gives A a vinegar bottle)
- A: Thanks.

The extra-communicative goal in this transaction is that A has some vinegar. B adopts A's goal by giving her some. This social cooperation (elsewhere (Gu, 1993b) I called it "rhetorical cooperation") presupposes communicative cooperation (or pragmatic cooperation). Grice's Cooperative Principle can be assumed to be operative at the level of communicative cooperation, but it is too strong an assumption at the level of social cooperation. Social cooperation is something assumed to be achievable, but not something to be taken for granted.

It is situated to spatial and temporal setting

In situated discourse speakers have to plan and execute their utterances in real time. This gives rise to what is known as "normal disfluency". In his corpus-based study of spoken English, Leech (1999) explores the impact that this spontaneity of situated discourse (conversation in his term) exerts on the grammar of spoken English. Three principles of on-line production for spoken English grammar are formulated: (1) Keep talking; (2) Limited planning ahead; and (3) Qualification of what has been said (see (14.3.1)). The grammatical features associated with the three principles make Leech wonder if "[i]n some respects, it may be appropriate to see the grammar of conversation as to some extent a different system with different rules from the grammar of written English." (see (14.3)). The significance of Leech's study for situated discourse analysis will be discussed later.

It is situated to the cognitive capacity of actual users

An actual user's cognitive capacity refers to the cognitive resources (problem solving ability, knowledge structure, language ability, etc.) potentially available to the interactant for use in interaction. An adult talking to a small child, a native speaker talking to a language learner, a doctor talking to a mentally impaired patient, are instances that have marked differences in cognitive capacity.

It is situated to performance contingencies of actual users

Performance contingencies are temporary conditions that affect interactants' use of language in producing discourse. They include what Chomsky calls "grammatically irrelevant conditions" such as "memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance". It must be noted here that, although the so-called "grammatically irrelevant conditions" can be indeed irrelevant to Chomsky whose interest is in the abstract knowledge of language, they are highly relevant to discourse analysts who are concerned with actual discourse. Moreover, so-called grammatical errors may not necessarily be errors discourse-wise.

Up to now we have discussed seven features of situated discourse. Next we turn to present a metalanguage that is required to account for situated discourse.

4. A tripartite analysis of situated discourse: an outline

Given a situated discourse, the task of a discourse analyst is to construct a know-that account of how the know-how participants conduct their joint discourse in pursuit of their communicative and extra-communicative goals. The account can be constructed on the basis of three-line analysis: goal development analysis, talk exchange development analysis, and interpersonal management analysis. Elsewhere I have called it a tripartite approach to discourse (Gu, 1996b, 1997a). It is revised and supplemented in this paper. Figure 3 is a graphic representation of the approach. To ease the burden of too much information placed on the short-term memory of the reader, Figure 1 is also reproduced here, with an extra advantage of helping generate a complete picture of the approach.

As discussed in Section 3 above, situated discourse is a goal-directed and dynamic social process. It captures its dynamism to analyze it in terms of goal development, talk exchange development and interpersonal management. The issues of how goals are developed, how talk exchanges are developed, and how interpersonal management is carried out vary from person to person, hence from one discourse to another. Goal development primarily refers to the process of pursuing extra-communicative goals. It captures the interface between linguistic communication (in Habermas's sense) and social interaction at large. Talk exchange development captures the actual talking among participants. Interpersonal management is interpersonal tie work on the basis of the participants' recognition of each other as responsible subject, and of their relative social positions in that particular transaction.

Note that goal development and interpersonal management affect and at the same time are realized in talk exchange development – hence the two arrows point to and meet at talk exchange development. An interlocutor's turn of talk is analyzed in terms of three general talk functions: backward, forward, and downward.

In what follows, we first give a brief description and demonstration of each component analysis. Then we discuss the theoretical root from which this model is derived, viz. Halliday's three meta-functions of language.

4.1. Goal development analysis

Goal development analysis includes the identification of goals, the choice of goals, goal structure, means of goal attainment, goal attaining strategies, and goal negotiation.

In institutionalized social situations, e.g., in a hospital, a supermarket, a restaurant, a school, there are a range of institutionalized goals that interactants are assumed, by default, to be pursuing by virtue of the roles they take. Unless otherwise agreed to, they are not supposed to pursue goals other than the institutionalized ones. Under these circumstances, the identification of goals, the choice of goals,

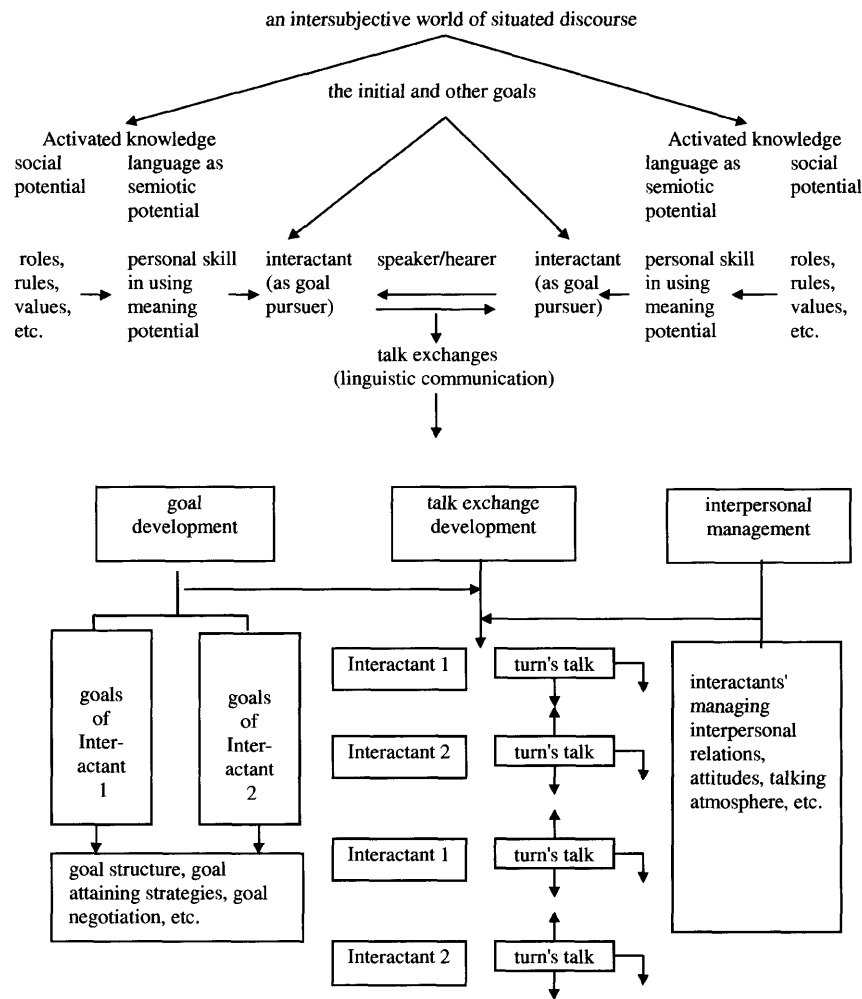


Fig. 3. A tripartite analysis of situated discourse. Situated discourse as a purposeful social process. Note that for the sake of simplicity the figure is willfully confined to a two-person dialogue. It is applicable to multiple-party discourse.

goal structure, and means of goal attainment, are prescribed before participants are engaged in actual discourse. Goal negotiation of the institutionalized ones is out of question. The distinctive features participants can have on the actual configuration of actual discourse are, among other things, the goal attaining strategies they adopt. Now let us compare the following two discourses, which took place in Beijing in

the summer of 1997.⁵

In a privately owned stall:

Xiao: (looking around)

Grocer: *Laoshi, chi shenme?* (What would you like to have, teacher?)

Xiao: *Xigua duoshao qian yi jin?* (How much is water melon?)

Grocer: *Yi kuai er.* (One yuan and twenty)

Xiao: *Yi kuai er? Gou gui de.* (One yuan and twenty? Very expensive.)

Grocer: *Hai, women jinlai jiu yi kuai yi, yi tian zuan bu liao jige qian. Nin yao wo gei ni pianyi yi mao.* (Oh, no. We bought in at one yuan and ten. We only earn a few quids a day. I'll knock ten cents off if you buy it.)

Xiao: *Hao, lai yi ge.* (Ok, have one)

The customer has a goal: buy a water melon; the grocer also has a goal: earn more money by selling more. These two goals are institutionalized in the sense that the transaction of this kind taken in that premise is protected by the law. The goal structure is collaborative, that is, the attainment of the customer's goal facilitates the attainment of the grocer's, and vice versa. This collaborative goal relation secures the cooperative exchanges between the two participants. However, they have to negotiate the terms of goal attainment: the customer wants to attain the goal at a cheap price, whereas the other wants to earn more money either by charging more, or by selling more. From the customer's point of view, he has an alternative means of goal attainment, for example, he can go to other stalls. This gives him an extra advantage over the grocer. From the grocer's point of view, she also has an alternative means of attaining her goal, that is, invite a new customer. But it is to his best advantage to keep old customers and invite more new customers. These goal attaining considerations can be graphically represented as follows (see Figure 4).

Here is the episode at the publicly owned store. Two male customers, speaking a Beijing suburb dialect, interacted with two shop women:

Male customer 1: *Ai!* (Hai!)

Shop woman 1: (turned around) *Ni ai shui ya, bu dong limao. Jiao xiaojie.* (Whom are you using hai to? Don't know how to be polite. Call me miss.)

Male customer 1: *Women zai jia du zheme jiao.* (We do it like this at home.)

Shop woman 2: *Yao zheme jiao hui jia jiao. Zhe shi Beijing.* (Go home and do it. This is Beijing.)

Male customer 2: *Zhege dianchi.* (This battery cell)

Shop woman 1: (shows it to the male.)

(The two males paid and went.)

⁵ The data were from our collection of shopping and bargaining discourse corpora in Beijing. They were not audio-taped, because the environment was too noisy for the purpose, but field notes taken stealthily on the spot. The privately owned stall and the publicly owned stall were physically nearby.

Privately owned stall

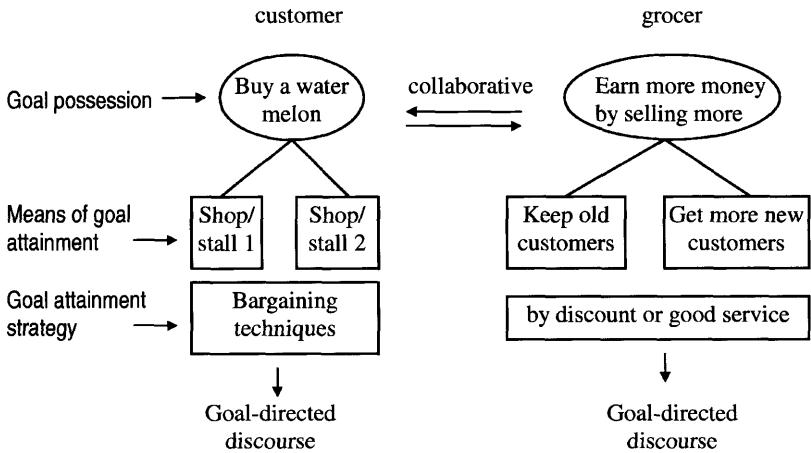


Fig. 4.

Under the circumstances we knew the male customers wanted to buy something, and the shop women were selling things. In this regard, the goals and goal structure in this transaction are very much similar to those in the previous case. There are two differences, though. Since it is a publicly owned stall with all prices fixed, the two males did not have the option of reaching a bargain at the price they preferred. The shop women, on the other hand, differ from the grocer in that they do not earn more money by selling more. They earn their salary by selling goods for the shop. With these in mind, we can construct a graphics of goal attainment considerations as follows (see Figure 5).

As we can see, the actual discourse did not proceed the way it was expected. Before the first male customer vocalized his goal, he was intercepted with a "lesson" on how to be polite in Beijing. The two males did not protest against it to the shop manager, nor went to another shop instead. They simply took the goods and left.

The unexpected "lesson" is part of the notion of goal development. The goals represented in the graphics are what Cody, Canary and Smith (1994, p. 45) have termed "proactive goals", "ones that actors plan to achieve and direct their behaviors toward achieving". The goals pursued by giving this "lesson" are "reactive goals", "ones where an actor is confronted with a problem . . . the actor is less able to plan and is in less control of the sequence of events". The shop women reacted to the way they were summoned. They took it as an insult, unaware of the fact it was quite normal in the suburbs to summon people, using it. To the male customers the shop women's reaction was also unexpected. So the actual goal attainment process can be constructed like this (see Figure 6).

Publicly owned stall

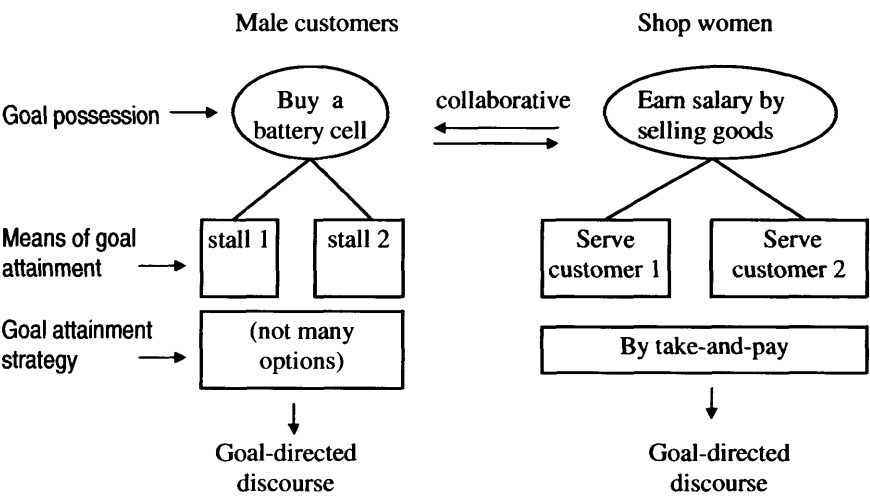
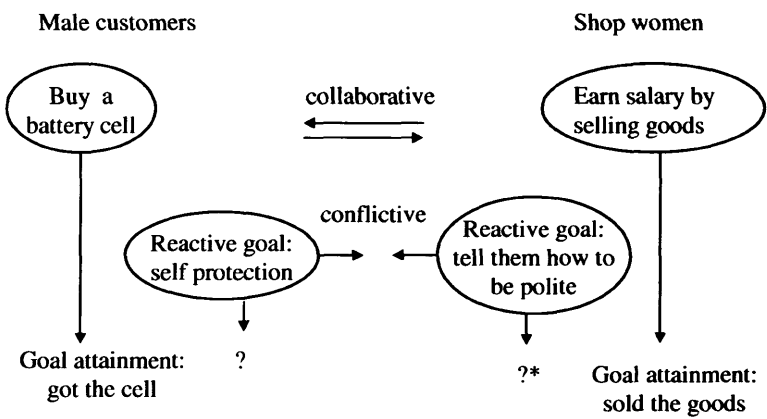


Fig. 5.

Publicly owned stall



* We agree with Cody, Canary and Smith that reactive goals differ fundamentally from proactive goals. Reactive goals are very much understudied. We are not sure how they should be properly handled.

Fig. 6.

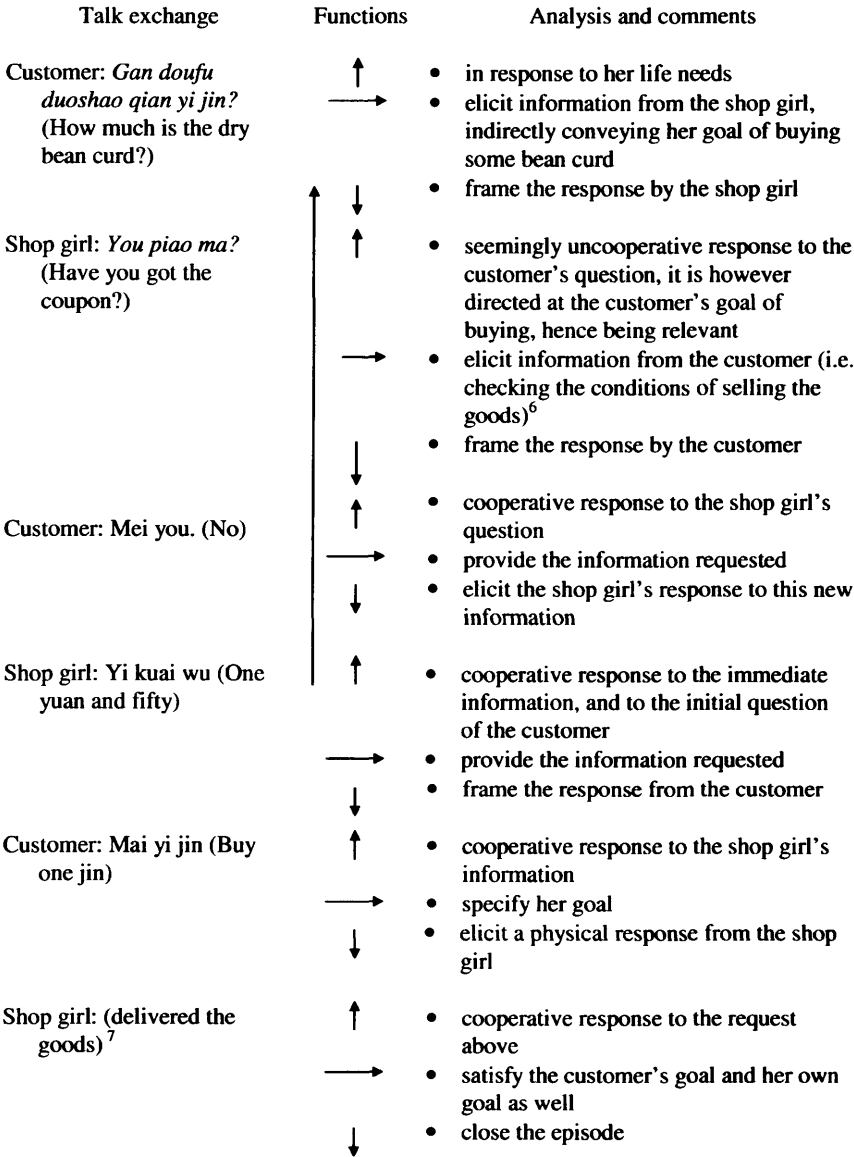
4.2. Talk exchange development analysis

Conversation analysis, studies on discourse markers, discourse topic continuity, textual cohesion and coherence, have contributed enormously to the understanding of how conversation (or discourse or text or talk) works. The literature is so well-known that it almost becomes tedious to cite it here. It goes without saying the present paper has benefited from the pool of knowledge. However, we treat talk exchanges as a product by participating individual users, not as an instance of a particular register or a discourse type. Consequently we emphasize the choices available to the participants and those made by them with regard to the communicative, and extra-communicative goals and to the interpersonal tie work in question. A given situated discourse is a unique configuration of choices made by the participants. The significance of such a configuration can be brought to light by comparing it with others with the same goals. For example, in my study of nurse-patient interaction, I collected, in less than two hours, four instances involving four different nurses in response to the two bed-bound patients' request for a bedpan. The goals and goal structure of the four instances were exactly the same. However, the talk exchanges between the four nurses and the two patients were different, thus giving rise to four variations of talk exchanges over one and the same goals and goal structure. Linguistically the four variations have no significance, however, interpersonally as four pieces of social reality, they have direct and dramatic impact on the qualities of health service, and on the satisfaction the patients felt about their treatment (see (Gu, 1997a) for detailed analysis).

As pointed out above, a turn's talk is analyzed in terms of three functions: backward, forward, and downward. Backward function refers to its connection with the previous text (including immediate and remote ones) or context. Forward function refers to the fresh contribution of the turn's talk to discourse development as a whole. Downward function refers to the constraining effect on the turn's talk that follows. The three function analysis is briefly demonstrated in Figure 7.

4.3. Interpersonal management analysis

Interpersonal management analysis focuses on the way one treats and is being treated by one's partner during the discourse process. The existing role relations can be reinforced by discourse, and can also be challenged or modified by it. One may treat the other coldly or warm-heartedly. One may sound patronizing and condescending, or quite slavish and humble. Like goal attainment analysis, interpersonal management can also be analyzed in terms of strategies. For example, in my study (Gu, 1996a) of 25 clinic visits, doctors have five general strategies of interpersonal management: (1) maintaining a friendly atmosphere (*heshan de qifen*); (2) showing sympathy and concern (*guanxin tongqing*); (3) keeping patience (*naixin*); (4) adopting a non-authoritative manner of speaking (*shangliang*



⁶ To an outsider, the shop girl's question may sound bizarre. It was quite a relevant question to the customer, who knew that dry bean curd was sold at two different prices with or without coupon.

⁷ This data was recorded by Zhao Yingling.

Fig. 7.

kouwen); and (5) meeting patients' demands (*mangzu yaoqiu*). Patients' interpersonal management is motivated by the assumption that a good relation will lead to better service. Deference presentation is the major strategy in their interpersonal management, and it is substantiated by (1) sitting posture, e.g., no cross legs, slightly leaning forward; (2) voice quality, e.g., speaking with a humble tone; (3) compliance with the doctor's demands; (4) using politeness markers, e.g., *nin* (= French *vous*), *qing* (please), *nengbuneng* (would it be possible), and indirectness strategies; (5) paying compliments; and (6) expressing gratitude, e.g., *xiexie* (thanks), *mafan* (trouble you).

4.4. Theoretical root

The tripartite analysis model outlined above has its immediate theoretical link with Halliday's three meta-functions of language. Halliday (1978, p. 21–22) lists four general functions which he believes to be universal in all human cultures.

(1) Language has to interpret the whole of our experience, reducing the indefinitely varied phenomena of the world around us, and also of the world inside us, the processes of our own consciousness, to a manageable number of classes of phenomena: types of processes, events and actions, classes of objects, people and institutions, and the like.

(2) Language has to express certain elementary logical relations, like 'and' and 'or' and 'if', as well as those created by language itself such as 'namely', 'says' and 'means'.

(3) Language has to express our participation, as speakers, in the speech situation; the roles we take on ourselves and impose on others; our wishes, feelings, attitudes and judgements.

(4) Language has to do all these things simultaneously, in a way which relates what is being said to the context in which it is being said, both to what has been said before and to the context of situation; in other words, it has to be capable of being organized as relevant discourse, not just as words and sentences in a grammar-book or dictionary.

The wording of this quote unequivocally treats language as if it had a life of its own, and did all those things all by itself. We fully agree with Halliday that language has all these functions, but we must not forget the fact that it is language users who use language to do these things and many more besides. Whereas Halliday skips the actual use of language and concentrates on language as behavior potential, as meaning potential and as speech potential, the tripartite model restores the actual user to its dominating role, reducing language to a subordinate position. To put it differently, Halliday takes the actual use as given, and explores its impact on language. Situated discourse analysis, on the other hand, takes language as given, and investigates how it is actually used by language users in doing and achieving things.

Broadly speaking, goal development, and interpersonal management correspond to Halliday's interpersonal function. Talk exchanges development corresponds to ideational and textual functions. Note that Halliday's "two very general purposes" are long term abstract goals that transcend individual users, whereas goals in situated discourse analysis are much more diversified, situation-specific and user-specific.

5. Situated discourse analysis in retrospect

What was presented above is a skeleton of a vast research programme. A book-length treatment of the topic is in preparation in order to work out further details that can do real justice to it. In this final section we discuss one more urgent issue. Our avowed aim is to develop a model of analysis that can construct a know-that account of know-how performance by actual users. One immediate objection to this effort is the question: What is the point of doing it? Situated discourses analyzed are unique instances of language use, which have no universality or theoretical value. To this challenge we have the following reply.

We agree with Halliday that "... it is the uses of language that, over tens of thousands of generations, have shaped the system" (Halliday, 1994, p. xiii). Functionally oriented linguists have been for too long preoccupied with the general uses, ignoring the fact the general uses are idealized abstractions of actual individualized uses which are the only actual data for the abstraction. To study actual uses is to come down from the abstraction ladder to face language in its original form.

On the other hand, we call to question the habit of treating actual uses as instantiations of the underlying system. This treatment can leave a misleading impression that the underlying system, once evolved to maturity, becomes a fixed entity that all each individual user can do about it is exercise his or her incomplete share of it to generate messy situated discourses. The view we attempt to advance is that a situated discourse is a *fresh contribution* to the underlying system in the sense that it extends the life of the system or that it adds new things to it. Here Wittgenstein's image of language as an ancient city is worth quoting:

Our language can be seen as an ancient city: a maze of little streets and squares, of old and new houses, and of houses with additions from various periods; and this surrounded by a multitude of new boroughs with straight regular streets and uniform houses. (1958, 8e)

Of course his metaphor should not be taken too literally. But it helps us get away from the age-old chess metaphor and invites us to think about situated discourses in more dynamic terms.

Situated discourses are, in the final analysis, the original source of the underlying system. Bolinger (1980, p. 30) supports the assertion: "Syntax is frozen discourse." He observes:

The most obvious example is the tendency – which some languages convert into a rule, at least in the ‘main’ types of sentences – to express subjects before objects: . . . The reason may well be that the initiator of an action has to start functioning before any effect begins to be seen or felt in the object. Doing this most of the time for a good reason seems reason enough to do it as a matter of course and then you don’t have to think about it – unless something special shocks you into doing the opposite. . .

In our study of Chinese syntax (Shen and Gu, 1997), benefiting from Yuen Ren Chao’s insights, we attempt to show that the so-called minor sentences, wide spread in Chinese, are in fact fossilized question-answer sequences. Hopper and Thompson (1984) explore the discourse basis for lexical categories. Studies on grammaticalization (e.g., Heine, Claudi and Hunnemeyer, 1991; Sweetser, 1990) offer further evidence on the primacy of discourse to syntax, which is assumed to be the core of the underlying system.

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CHAPTER 7

Semantics vs. Pragmatics: *ANY in Game-Theoretical Semantics*

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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Precisely which linguistic phenomena are semantic ones and which are pragmatic ones is a theoretical issue – which linguistic phenomena shall receive semantic explanations, and which require explanations that invoke further conceptual apparatus? That some phenomena are semantical – that they are subject to explanation involving only semantical notions like truth and reference in addition to syntactic notions – is hardly disputable, for as Michael Dummett (1981) has observed, we have no idea what a theory of meaning would look like which does away with the distinction between a theory of sense and a theory of force, and a theory of sense must rest upon a prior theory of truth (a semantics). A theory of force is of course straightforwardly a piece of pragmatics, thus Dummett endorses the idea that a theoretical level of semantical description distinct from a level of pragmatic description is indispensable.

Even if it is well established that we must distinguish in our theory between semantic and pragmatic phenomena, the distinction is a fuzzy one. There are clearcut examples of semantic problems and clearcut examples of pragmatic ones – e.g., dependency relationships among quantifiers vs. interpretation of demonstratives – but there are also problems that are not so clearly one sort or the other. Competing theoretical frameworks may treat these borderline problems in different ways, so that a linguistic problem that is treated by purely semantical means in one theory is treated pragmatically by the other. In fact, it is sometimes not at all clear whether a given problem is subject to a purely semantical solution in a given theory, especially when that theory lends itself to some confusion as to whether the apparatus used to explain the involved phenomena is purely semantical or not. Such confusion has surrounded game-theoretical semantics since its inception in the early 1970s. In the following I present a case study in game-theoretical semantics (GTS), with an eye toward showing how the GTS apparatus can “semanticize” a pragmatic insight into the semantics of the notorious English quantifier *any*. While GTS is a properly semantical framework, not a pragmatic one (as I argued in Hand (1989)), its pragmatic-like features permit a unitary treatment of the alleged \forall/\exists ambiguity of *any* that avoids the familiar anti-ambiguity accounts.

1. Attitudes toward *any*

Semantical intuitions concerning the determiner *any* are confident and reliable across large numbers of speakers, but its semantics remains problematic. In particular, semantical theorists continue to debate the question whether *any* always represents universal quantification, or existential quantification, or sometimes one and sometimes the other. There are thus two unitarian views: universalism (e.g., Quine, 1960; Lasnik, 1975; Hintikka, 1983) and existentialism (Davison, 1980). Universalists think *any* is always a universal quantifier, and explain apparent counterexamples by positing that it has peculiar logical habits concerning scope relations with other operators. Existentialists think *any* is always existential, and explain

the apparent universal readings pragmatically. Opposing both groups of unitarians are the ambiguists (Stockwell et al., 1972; Jackendoff, 1972; Carlson, 1981; Higginbotham, 1988), who admit a universal/existential ambiguity.

In keeping with the *prima facie* distinction between universal and existential uses of *any*, call these \forall -*any* and \exists -*any*. This is a purely semantical distinction, but coincides with the syntactic distinction between generic and polarity *any*. The term “generic *any*” is unfortunate, suggesting a semantical criterion. Carlson (1981) speaks of “free-choice *any*” in this connection, but holds that free-choice *any* does not always manifest as \forall . For lack of a generally accepted term to contrast with “polarity *any*” on the basis of nonsemantical features, I follow tradition and use “generic”. Polarity *any* is a negative polarity item, while generic *any* may occur in virtually any context. Carlson describes various nonsemantical diagnostics for discriminating polarity and generic *any*.

My own use of the terms “ \forall -*any*” and “ \exists -*any*” is not meant to be an endorsement of the ambiguity view. Even universalists and existentialists can use these terms, since even they would admit to the presence of a *prima facie* distinction while denying its reality. I shall propose an analysis of *any* that unites these species semantically by giving a unitary account of its meaning, and attempt to explain why *any* manifests semantically in such apparently dissimilar ways. My proposed treatment of *any* is a unitarian treatment which does not attribute scopal misbehavior, but also does not posit that the core semantical meaning of *any* is either \forall or \exists . The account is inspired by some of Zeno Vendler’s remarks.

2. Vendler’s pragmatic account of *any*

Vendler (1967) makes some deep observations concerning *any*, but it is hard to see how to integrate them into a semantical theory of English quantification. He observes that *any* presents the hearer with a choice. For instance, (1a) gives the hearer a choice among possible instances of the quantifier phrase, and the speaker is committed to the truth of whichever instance(s) the hearer selects, e.g., the members of (1b).

- (1) (a) If any member contributes, I’ll be surprised.
- (b) If John contributes, I’ll be surprised; if Bill contributes, I’ll be surprised; ...
- (2) (a) $(\exists x)(x \text{ is a member} \ \& \ x \text{ contributes}) \rightarrow$ I’ll be surprised
- (b) $(\forall x)(x \text{ is a member} \ \& \ x \text{ contributes}) \rightarrow$ I’ll be surprised

(1a) appears to have the form (2a). Universalists note the equivalence of this form with (2b), and claim that *any* has the semantical idiosyncrasy of always taking wide scope over *if*. There are cases where the universalist construal of *any* fails to

achieve the correct interpretation, however. In (3a), *any* seems not to be universal, and there is no operator present for *any* to be ill-behaved toward. Compare (3a) with (3b).

- (3) (a) Take any apple.
(b) Take every apple.

Vendler's observation is enlightening: (3a) offers the hearer a choice of apples, but (3b) does not. This account also does justice to (1a): for any member that the hearer might select, I'll be surprised if that member contributes.

The fact that both the universalist treatment and Vendler's treatment successfully interpret (1a) indicates that universal quantification can often be construed as presenting a choice to the speaker's "opponent", so to speak. This idea is codified in game-theoretical semantics (GTS). The GTS treatment of universal quantification offers a choice to the abstract game-player who has the role of "falsifier". For assertions, this role typically falls to the hearer (except in negative contexts, in the presence of explicit or implicit negative elements such as *not*, *nobody*, *deny*, or *doubt*), while the role typically falls to the speaker when the utterance is an imperative (Hilpinen, 1986; Hand, 1989). Thus the GTS analysis of (3b) assigns it the correct interpretation, but fails to interpret (3a) correctly. If Vendler is correct, this failure can be accounted for: on this account, the role of the player who is responsible for the selection in the game for (3a) is the speaker, since *any* is construed as universal, yet it is the hearer who should in fact be responsible. (See the discussion of Hilpinen's GTS treatment of imperatives below.)

Another case in which universalism and Vendler's view both are explanatory concerns the relation of *any* and negation, as in (4).

- (4) (a) I do not know any poem.
 $= (\forall x)(x \text{ is a poem} \rightarrow \sim(I \text{ know } x))$
 $= \sim(\exists x)(x \text{ is a poem} \& I \text{ know } x)$
 (b) I do not know every poem.
 $= \sim(\forall x)(x \text{ is a poem} \rightarrow I \text{ know } x)$

Jackendoff registers the following argument against universalism, an argument which I consider compelling, *ceteris paribus*.

[Universalism] is not consistent with [the] hypothesis that dependence of quantifiers and negation on each other is determined by structural considerations, as it claims that relative scope is determined on the basis of lexical, not structural, conditions. (Jackendoff, 1972, p. 338)

The real problem with *any* seems to be that there is no semantical unity to its occurrences. Universalism attributes a unitary semantics, but is hard to defend, as is existentialism. Ambiguism is more faithful to the data, but unsatisfactory from a

theoretical perspective: why must we posit distinct yet intimately related meanings for this word? Finally, Vendler's characterization, which finds a kind of unity in all of *any*'s manifestations, seems essentially pragmatic: how can this talk of the hearer's choice be integrated into a semantical apparatus?

Game-theoretical semantics can capture Vendler's pragmatic insight semantically. The key idea is to interpret *any* as a quantificational element which, while possessing a single, unitary meaning, manifests as \forall at times and as \exists at other times: a Vendlerian quantifier. It seems to me that GTS is unique among semantical frameworks in being able to accommodate this insight. Thus, if my suggested GTS treatment of *any* is correct, this supports GTS *vis-à-vis* competing semantical approaches.

3. *Any* as a Vendlerian quantifier in GTS

The game rules of a semantical game refer to players in the guises of roles they adopt and sometimes exchange. Call the players MAX and MIN, and call the roles Verifier and Falsifier. At the start of the semantical game, MAX has the role of Verifier and MIN has the role of Falsifier. The players make selections of individuals to instantiate quantifiers in the sentence at hand. When the sentence is an indicative, the Falsifier has to choose instances of universal quantifiers, and the Verifier has to choose instances of existential quantifiers. (The same idea holds for "strong" and "weak" connectives: the Falsifier selects a conjunct from φ -and- ψ , but the Verifier selects a disjunct from φ -or- ψ .) Sometimes the players MAX and MIN exchange roles in the course of a game, due to negative elements. The ability to refer to the players independently of the roles they have at a given point in the play will be the key to the GTS-Vendlerian account of *any*.

GTS involves ordering principles, which determine the order of application of game rules in a play of a semantical game. There are two general ordering principles, (O.command) and (O.LR). The former requires that rules be applied to eliminate higher (commanding) operators before the lower (commanded) operators are eliminated; the latter requires that left-right precedence of operators be respected.

Besides these general ordering principles, there are also specific ordering principles. Among them, a specific ordering principle controlling the logical behavior of *any* is usually included. Typically, *any* is treated as a universal by GTS semanticists (following Hintikka). The ordering principle for *any* requires that it be eliminated before *not* or *if*, even when this violates (O.command) and (O.LR). The effect of this special treatment is that *any* always has wide scope over a commanding *not* or *if*. This codifies the universalist view that *any* is always a wide-scope \forall .

By adopting universalism, we fail to exploit the unique resources of GTS. Game-theoretical semantics has a distinctly pragmatic feel; the rule-governed interaction of the players MAX and MIN reminds us strongly of rule-governed linguistic behaviors among language users. It would be a mistake to take this pragmatic charac-

ter of GTS too far, and to identify the players with actual flesh-and-blood language users. Nevertheless, there is an important connection between the players MAX and MIN, on the one hand, and language users, on the other. (Hand (1989) discusses this issue in detail.)

For present purposes, it is important that when the sentence in question is indicative, the speaker is responsible for its truth, and hence player MAX begins play of the semantical game as the Verifier; when the sentence in question is an imperative, the hearer is responsible for its satisfaction, hence MIN begins play of the game as the Verifier. Other than this one difference, which will come into play in Section 7, the GTS apparatus applies in the same way to imperatives as to indicatives.

According to Vendler's observation, *any* offers a choice to the hearer, regardless of the polarity of its occurrence.

- (5) (a) Anyone can juggle two balls.
- (b) I don't know any poem.

In asserting (5a), I invite you to select a person; the person you select can juggle two balls. Here the positive polarity occurrence of *any* is \forall . In asserting (5b), I invite you to select a poem; whichever poem you select, I don't know it. Since *not* commands *any* in (5b), it is assumed that negation is the wide-scope operator, hence *any* must function as \exists . The other option is to give *any* wide scope in violation of the command relations, in which case *any* is \forall . In fact, the latter is how I just presented the meaning of (5b), and seems more compatible with Vendler's own remarks. (His account of (1a) construes it as (2b), for instance.) The treatment of *any* which I am about to suggest allows scope relations to be determined by command relations, but preserves Vendler's key idea that the hearer is offered a choice regardless of the polarity.

I propose to integrate Vendler's pragmatic insight into GTS by formulating the game rule for *any* so as to require MIN to select an instance, regardless of MIN's role as Verifier or Falsifier. At the same time, we abandon specific ordering principles governing interpretation of *any*, so that its relative scope is determined by command relations. When the context has positive polarity, MIN is the Falsifier, so that in these contexts *any* is interpreted as a universal. In negative polarity contexts in indicatives, MIN is the Verifier, so that *any* is normally interpreted as \exists (but see the discussion of \forall -*any* and negative polarity in Sections 5 and 6 below).

This treatment has the same advantage that ambiguity has over universalism and existentialism, but also has the advantage which the latter two analyses have over ambiguity. Like universalism and existentialism, this is a unitarian analysis: *any* is not ambiguous. Like ambiguity, however, this treatment does not attribute scopal misbehavior to *any*: having formulated the Vendlerian treatment as above, there is no longer a need to posit special ordering principles conflicting with command and linear precedence. The scope of *any* is determined by structural considerations no less than the scope of any other quantifier, and the semantical interpretation captures our semantical intuitions.

Now although my Vendlerian semantical analysis is a unitarian treatment of *any*, some attention must be paid to the novel kind of unity attributed. The key idea is that *any* is unambiguous because it always refers the choice to the same player in semantical games, MIN. However, this does not force it to assume uniformly the character of \forall or \exists .

4. Universal *any*

Generic *any* is (at least usually) a universal. The GTS-Vendlerian treatment interprets *any* in these contexts so that its meaning does not differ from the meaning attributed to it by universalists. In positive polarity indicative contexts, it makes no difference whether the rule for *any* is formulated so as to refer the choice of an instance to MIN or to the Falsifier, since in these contexts MIN is the Falsifier. It is a problem for existentialism that generic *any* is a universal, but not for universalism, which the old GTS view supports. Rather, the problem concerning generic *any* is to explain the difference between (6a) and (6b), since *any* and *every* are both universals.

- (6) (a) Everyone might be elected.
 (b) Anyone might be elected.

The difference is clear: (6a) is paraphrased $\diamond(\forall x)(x \text{ is elected})$, while (6b) is paraphrased $(\forall x) \diamond (x \text{ is elected})$. This suggests that (6a), not (6b), is anomalous. The left-right precedence relations of *any* and *might* in (6b) match the scopal relations of \forall and \diamond in the paraphrase. The precedence relations of (6a) do not match the scopal relations in its paraphrase. Thus it appears that a treatment of (6a) requires us to ascribe to *every* a tendency to allow modals to take priority. No unusual behavior of *any* is seen in (6b). Related examples are more difficult.

- (7) (a) You must pick any apple that squirrels have not damaged.
 (b) You must pick every apple that squirrels have not damaged.

Hintikka suggests that these differ in the following respect.

However the difference between (7a) and (7b) is to be accounted for in detail, it is clear that in (7a) the choice of the apple is independent of the choice between alternative courses of events that are brought about by *must*, whereas in (7b) the choice is restricted to those that actually have not been damaged. In other words, the scope of *every* has to be smaller than that of *must* in (7b)... (Hintikka, 1983, p. 246)

Hintikka suggests that the difference between (7a) and (7b) is the difference between (8a) and (8b).

- (8) (a) $(\forall x)(x \text{ is an apple that squirrels have not damaged} \rightarrow \text{you must make it the case that you pick } x)$
 (b) you must make it the case that $(\forall x)(x \text{ is an apple that squirrels have not damaged} \rightarrow \text{you pick } x)$

As a universalist, Hintikka holds that *any* is misbehaving scopally, hence he holds that *every* has narrow scope with respect to *must*, while *any* has wide scope. Thus (8a) should paraphrase (7a), and (8b), (7b). I have some difficulty distinguishing (7a) from (7b) *vis-à-vis* (8a) and (8b), but a more serious problem for Hintikka's account is that he explains the ungrammaticality of (9a) by citing the equivalence of (9a) and (9b).

- (9) (a) *You must pick any apple.
 (b) You must pick every apple.

This explanation of the ungrammaticality of (9a) invokes Hintikka's celebrated *any*-thesis, according to which an *any*-sentence is ungrammatical if it is equivalent to its counterpart *every*-sentence. Virtually all universalists admit that the presence of *any* in a language already possessing *every* must be motivated by some semantical need, hence in cases where an *any*-sentence is equivalent to its counterpart *every*-sentence, *any* serves no purpose. This consideration is the theoretical basis of the ungrammaticality of (9a).

In rejecting (9a), Hintikka implicitly holds that *any* and *every* do not differ in their scopes relative to *must* in (9a) and (9b). It is therefore unclear how Hintikka can account for the scope difference between (7a) and (7b); with this in mind, Hintikka's account of the difference between (7a) and (7b) looks somewhat *ad hoc*.

I do not know how to explain the difference between (7a) and (7b), nor have I seen a compelling account. My Vendlerian account does not distinguish (9a) and (9b) in any helpful way, attributing to both the same meaning. It is reasonable to assert that *any* may not occur grammatically in a position which *every* may also occupy to the same semantical effect, hence the ungrammaticality of (9a). In view of the linear precedence relations here, I incline to the opinion that if a scopal peculiarity is present, it afflicts *every* instead of *any*. The presence of relative clauses virtually guarantees a difference between \forall -*any* and *every*, even when no operators are present to introduce scope distinctions. Perhaps the fundamental difference between (7a) and (7b) is pragmatic: *every* presupposes the existence of some apples, but *any* does not.

The Vendlerian analysis does as well as any competitor to explain why *any* exists. Universalism also has a ready answer to the question.

Probably the most interesting problem about *any*, and unfortunately, one that I have no developed theory for, is why it exists, that is, why an alternate form of the universal quantifier is needed. I suspect that its primary function is the resolution of potential scope ambiguities. (Lasnik, 1975, p. 306)

Vendler's own observations indicate why a language might need Vendlerian quantifiers: the meaning of a sentence may require that certain options of the hearer be included in the semantical representation of the sentence. The Vendlerian account of *any* in GTS does precisely this.

5. Existential *any* and negative environments

Existential occurrences of *any* are the cases where universalists call into play the alleged tendency of *any* as \forall to take wide scope over other operators present such as *not* and *if*. Quantifier-exchange equivalences like $(\forall x)\sim\varphi \leftrightarrow \sim(\exists x)\varphi$ and $(\exists x)\sim\varphi \leftrightarrow \sim(\forall x)\varphi$ explain why the universalist analysis works, when it does. This account depends on a notion of certain contexts being “semantically negative”, which I shall take for granted as corresponding to the syntactic notion of negative polarity.

A quantifier whose game rule refers the selection of an instance to MIN regardless of the Verifier/Falsifier role that MIN bears will in effect construe *any* as an existential in semantically negative contexts, the assumption being that these negative contexts are generally associated with a reversal of roles (as in the case of explicit negation). This is because it is in such contexts that MIN is the Verifier, hence a selection by MIN in these circumstances is associated with \exists . It need not be posited that the scope of *any* is anomalous (i.e., violating command relations). Thus my account does not suffer from this defect of universalism.

At the same time, the Vendlerian analysis does not suffer from the theoretical weakness of ambiguity. The present account is a unitarian view, assigning to *any* a single game rule. Unlike quantifiers that are better understood, *any* has the ability to manifest as \forall under certain conditions and as \exists under others, but at the same time is not ambiguous.

The Vendlerian analysis appropriately interprets cases of \exists -*any* where the negative polarity is determined by verbs or adverbs, as well. Consider, for example, (10a).

- (10) (a) I doubt that any cabinet member is a communist.
 (b) $(\forall x)(x \text{ is a cabinet member} \rightarrow \text{I doubt that } x \text{ is a communist})$
 (c) I doubt that $(\exists x)(x \text{ is a cabinet member} \ \& \ x \text{ is a communist})$

The universalist's interpretation of (10a) is (10b) and the Vendlerian interpretation is (10c). There is a significant difference of meaning between (10b) and (10c): the former is *de re* doubt, and the latter is *de dicto* doubt. That is, (10b) attributes to me a number of doubts, one for each cabinet member, whereas (10c) attributes only one, a doubt which is not directed toward any particular cabinet member. Likewise (10a).

Turning to negative polarity adverbs, consider (11a).

- (11) (a) The teacher rarely flunks any student.
 (b) $(\forall x)(x \text{ is a student} \rightarrow \text{rarely (the teacher flunks } x))$
 (c) rarely $(\exists x)(x \text{ is a student} \& \text{ the teacher flunks } x)$

The universalist must produce (11b) as the reading of (11a), and this is clearly a mistake. (I think Higginbotham (1988) was the first to notice this.) Given a treatment of the negative polarity adverb *rarely*, the Vendlerian account should interpret (11a) as (11c). Provisionally, let *rarely* trigger a selection of a time by MIN in the role of Falsifier, followed by an exchange of roles: MAX's winning strategy for (11a) falsifies $(\exists x)(x \text{ is a student} \& \text{ the teacher flunks } x)$, hence MAX must have the role of Falsifier at this point. So MIN is the Verifier at this point in the game, and *any* is existential.¹

Universalism can be rescued, but there is a cost. If we introduce into the apparatus a means of "unpacking" *rarely* into the "logical form" *usually not*, then it may be claimed that *any* takes wide scope over *not* but not over *usually*, producing the reading *usually* $(\forall x)[x \text{ is a student} \rightarrow \sim(\text{the teacher flunks } x)]$. The cost is that the semantics is thus committed to a treatment of such adverbs by lexical decomposition, and this approach to lexical semantics is subject to well-known difficulties of its own.

Both generic *any* and polarity *any* may appear in negative contexts. Ambiguists use this fact to explain certain ambiguities. For instance, the difference between polarity *any* and generic *any* is (supposedly) the difference between the preferred reading of (12a) and the sole reading of (12b).

- (12) (a) Jane can't beat anyone at chess.
 (b) Jane can't beat just anyone at chess.

In fact, (12a) can be interpreted as equivalent to (12b), i.e., as a case of \forall -*any*, when uttered with the right intonation: *Well, no, Jane can't beat ANYone, but she sure can beat YOU!* The question is, how does the GTS-Vendlerian account explain \forall -*any* in these negative contexts?

This is not a purely semantical phenomenon, but rather involves Horn's (1985) pragmatic distinction between descriptive and metalinguistic negation. When (12a) is uttered with the appropriate intonation, the negation is not a semantical element of the sentence on a par with *not* in the more ordinary utterance of (12a), but rather

¹ The treatment I suggest may remind one of a lexical decomposition treatment, since *rarely* is treated in two stages: a choice of a time by MIN the Falsifier, followed by a reversal of roles, is the course that a game would take if *rarely* were decomposed at the object language level into *usually not*. However, my own treatment involves no such decomposition of the object language, and is thus not committed to there being operators in the object language which themselves effect the moves brought about by the operator in question. I see no objection to multiple-stage treatments of operators; problems surround the further assumption concerning the object language, but this is characteristic of lexical decomposition treatments, not of mine.

registers the speaker's (metalinguistic) objection to something about a previous utterance of *Jane can beat anyone*. Consequently, *any* remains universal because it is not in the scope of any negative semantical elements of its context. This account is supported by two considerations. First, although (12a) with \exists -*any* can begin a discourse, (12a) as (12b) must occur either as a response to a prior claim, or when starting a discourse must assume a contrary conviction on the interlocutor's part. Second, intonation often is a mark of metalinguistic negation, as is *just*. Horn remarks, "In such cases, the negation often seems to build in a covert *just* or *only* which can in fact be expressed directly without changing the import" (1985, p. 142). This is precisely the relation of (11a) and (11b). Thus the occurrence of \forall -*any* in these cases does not count against the present proposal.

Some other problematic cases deserve attention. Carlson (1981) claims that each of the following is ambiguous between \exists -*any* and \forall -*any*.

- (13) (a) If anyone can move that stone, I'll be amazed.
 (b) Does anyone like Ralph?
 (c) I doubt that anyone could be at the door.
 (d) Thanks be to God that anyone likes my novels!

Having just introduced Horn's distinction between descriptive and metalinguistic negation, it is appropriate to deal with (13c) first. As we distinguish descriptive from metalinguistic negation, following Horn, we may likewise distinguish descriptive from metalinguistic doubting. Such metalinguistic doubting is clearly possible. *Do you think that Bill trapped two mongeese? Oh, I doubt he trapped two monGEESE, but he might have trapped some monGOOSES, though.* Similarly, (13c) is not ambiguous between two cases of descriptive negation: (i) I doubt that $(\exists x)(x$ could be at the door) (polarity *any*), and (ii) I doubt that $(\forall x)(x$ could be at the door) (allegedly generic *any*). Instead, (13c) is ambiguous between the polarity *any* reading and a metalinguistic reading. (As it happens, any speaker who intends the metalinguistic reading probably doubts $(\forall x)(x$ could be at the door). It does not follow that (ii) is a reading of (13c).)

Note that the alleged generic reading of (13c) lends itself to the use of *just* very naturally. To hold that (13c) can be read as generic *any* commits one to the view that *just* sometimes signals generic *any*, but sometimes serves in metalinguistic negation. It follows that certain sentences are ambiguous between a metalinguistic reading and a generic *any* reading: *Checkling can't outrun just anyone*. But anyone who asserts this as metalinguistic negation probably also believes $\sim(\forall x)$ (Checkling can outrun x), and will be taken to be committing herself to it. Thus on occasion it is appropriate to ascribe this belief, though it is not a reading.

The GTS-Vendlerian account works quite smoothly in producing the preferred (\exists -*any*) readings of conditionals like (13a). Following Hintikka and Carlson (1979), conditionals are interpreted by means of subgames. For a conditional

$\varphi \rightarrow \psi$, a game is first played for the antecedent φ . This subgame for the antecedent is peculiar, however, in that it begins with MAX as the Falsifier and MIN as the Verifier. The reason for this is that one way for MAX to demonstrate the truth of $\varphi \rightarrow \psi$ is to establish the falsity of φ . Consequently, the Verifier for $\varphi \rightarrow \psi$ is the Falsifier for φ (though the Verifier for ψ). Now, this means that in the subgame for the antecedent of (13a), *Anyone can move that stone*, MIN is the Verifier, so that *any* is here construed as \exists . (Universalists explain it by citing the equivalence of $(\forall x)(\varphi \rightarrow \psi)$ and $(\exists x)\varphi \rightarrow \psi$ when ψ has no free x .)

Since this is so, where does the alleged \forall -*any* reading of (13a) come from? Note that this reading takes *just* naturally: *If just anyone can move that stone, I'll be amazed*. Here again, a metalinguistic feel is present: this is natural as a response to the claim *Anyone can move that stone*, a case of \forall -*any*, but unnatural alone. This problem can profitably be seen in light of Linebarger's (1981) suggestion that (metalinguistic) negation can sometimes be regarded as the negation of a metalinguistic truth-predicate. Generalized to the present case, the \forall -*any* reading of (13a) is actually the following: *If TRUE (anyone can move this stone), I'll be amazed*. Similarly, only the \forall -*any* reading is available for *If it's true that anyone can move this stone, I'll be amazed*. Again, the appearance of a \forall -*any* is due to a metalinguistic operation; when everything takes place at the object language level, only \exists -*any* makes an appearance.

(13b) is a difficult case. Perhaps the explanation for the \exists -*any* reading is to be found in the observation that *I know whether anyone likes Bob* is equivalent to *If anyone likes Bob, then I know it*, and if no one likes Bob, then I know that. (See (Hand, 1988) for a GTS treatment of *whether* along this line.) If so, then this problem reduces to the problem of existential generic *any* in antecedents of conditionals, and this is no problem for the GTS-Vendlerian account. What about the \forall -*any* reading equivalent to *Does just anyone like Bob*? Maybe a metalinguistic move is appropriate here.

Finally, I confess that I do not know what to say about (13d). This relatively marginal case can perhaps be set aside as a standing puzzle at present.

The metalinguistic arguments clearly lend support to a unitarian approach to *any*, since it becomes possible in many cases to argue that apparently lexical ambiguities are not really semantical ambiguities at all. They are ambiguities between descriptive (i.e., object-language level semantical) and metalinguistic readings, and are therefore not to be explained by semantical theory proper. The metalinguistic move has less intuitive appeal in some cases than in others, however, so here is a general observation which supports it.

If $X-A-Y$ is lexically ambiguous due to a lexical ambiguity of the constituent A , then it seems to follow almost trivially that A should exhibit the relevant ambiguity when considered alone. Each of the pairs in (14) consists in (i) an $X-A-Y$ and (ii) the constituent A .

- (14) (a) (i) If anyone can move that stone, I'll be amazed.
 (ii) Anyone can move that stone.
 (b) (i) I doubt that anyone could be at the door.
 (ii) Anyone could be at the door.
 (c) (i) I don't think Pippa would be nice to any stranger.
 (ii) Pippa would be nice to any stranger.

In every case, (i) is allegedly ambiguous between an \forall -*any* and an \exists -*any* reading. The metalinguistic move is to deny that there is an \forall -*any* present at the level of object-language semantics, but rather that these readings are the result of an interaction of semantics with metalinguistic mechanisms: metalinguistic truth-predication, metalinguistic doubt, and metalinguistic negation. Thus it is possible to deny that the (i) examples really exhibit lexical ambiguity.

If (i) is lexically ambiguous due to a \forall/\exists lexical ambiguity in the (ii)-constituent, then consideration of (ii) in isolation should reveal this ambiguity. It is, after all, lexical, but in none of these examples is there a lexical ambiguity in (ii) due to *any*. The (ii) examples are all clearly generic. The GTS-Vendlerian account predicts that the generic (\forall) status of *any* in (ii) and the polarity (\exists) reading of (i) are of a piece, since the (ii) constituent contributes to (i) precisely the meaning it carries in isolation. This (Vendlerian) meaning is such that the universal (ii) and the existential reading of (i) do not conflict, but in fact are manifestations of the unique single meaning of the (ii)-constituent. Thus it stands to reason that any other reading of (i) must come from elsewhere than a compositional semantical mechanism.

The central problem for the GTS-Vendlerian account of polarity *any* is the characterization of licensing contexts as somehow “semantically negative”, i.e., to establish that all licensing contexts for polarity *any* involve role-swapping by MAX and MIN, thus establishing that polarity *any* is always existential. I do not know how to establish this conclusively, but I can give a strong reason to believe that such a characterization is possible.

Consider the following property of explicit negation. Given $\sim\varphi$, then for any ψ such that ψ entails φ , we have $\sim\psi$. Any operator with this property is said to be decreasing. An increasing operator **O** has the converse property: given **O** φ , then for any ψ such that φ entails ψ , we have **O** ψ . It is helpful to think in terms of sets here. Think of the proposition φ as the set of possible worlds in which φ holds. Then a decreasing operator **D** is such that when **D** φ and $\psi \subseteq \varphi$, then **D** ψ . An increasing operator **O** is such that when **O** φ and $\varphi \subseteq \psi$, then **O** ψ . These properties of operators are known as monotonicity properties. (The terminology “downward-entailing” and “upward-entailing” is also common.)

Associated with natural language quantifiers are two contexts, with respect to each of which the quantifier may be decreasing or increasing. Consider, for instance, *every S is P*. Given that every S is P , and that $S' \subseteq S$, then we have that every S' is P ; and if $P \subseteq P'$, we have also that every S is P' . Thus *every* is said to

be *decreasing* in its first coordinate and *increasing* in its second coordinate ($\downarrow\uparrow$). The quantifier *some* is increasing in both its coordinates ($\uparrow\uparrow$), and *no* is decreasing in both its coordinates ($\downarrow\downarrow$).

An important (perhaps the most important) generalization known about the distribution of polarity *any* is that it is licensed precisely by decreasing operators. Since some operators (e.g., *every*) are decreasing with respect to one environment and increasing with respect to another, we should say more precisely that polarity *any* appears grammatically only in decreasing environments. Thus we find polarity *any* in explicitly negative contexts, in the first coordinate of *every* but not the second, in neither coordinate of *some*, and in either coordinate of *no*.

(15) *first coordinate*

Every

*Some student who knows anything about logic will pass the test.

No

second coordinate

*Every

*Some student who passes the test knows anything about logic.

No

(Notice that the decreasing environments associated with these classical quantifiers are precisely the positions of distributed terms in Aristotelian syllogistic: universal statements (A and E) have distributed subject terms, and negative statements (E and O) have distributed predicate terms. Thus *every* is $\downarrow\uparrow$, *some* is $\uparrow\uparrow$, and *no* is $\downarrow\downarrow$.)

Another decreasing environment is the antecedent of a conditional. Given that if φ then ψ , and that if θ then φ , we have that if θ then ψ . Conditionals are increasing in their consequents (thus are $\downarrow\uparrow$). (Since conditionals correspond to the set-theoretic relation \subseteq , the monotonicity properties of the conditional correspond to transitivity of \subseteq ; for antecedents: $\varphi \rightarrow \psi$ and $\theta \rightarrow \varphi$ entail $\theta \rightarrow \psi$, and for consequents: $\varphi \rightarrow \psi$ and $\psi \rightarrow \theta$ entail $\varphi \rightarrow \theta$.) Polarity *any* therefore appears in the antecedents, but not consequents, of conditionals. Negative verbs and adverbs are also decreasing: if I doubt that φ , and ψ entails φ , then I doubt that ψ (assuming logical omniscience), and if the teacher rarely flunks any student, then the teacher rarely flunks any happy student.

The GTS-Vendlerian account predicts that polarity *any* is licensed precisely in role-reversal contexts. Consequently, the account must make a case that decreasing contexts are role-reversal contexts. For some decreasing contexts, this is easy enough: explicit negation and antecedents of conditionals, for example. In semantic games, the defense of a given sentence sometimes (in fact, typically) requires defending some further sentence. This happens when truth of the given sentence cannot obtain without the further sentence also being true, i.e., entailment. The

game thus involves an increasing transition, from φ to ψ when φ entails ψ . When this happens, the players retain the same roles for ψ that they had for φ . In special cases, however, the defense of φ may require attacking ψ , as when the defense of $\sim\psi$ requires attacking ψ . Negation is the paradigm negative operator, and is treated by role-reversal.

When the given sentence is a conditional $\varphi \rightarrow \psi$, the defending player can succeed in either of two ways: successfully attacking φ , or successfully defending ψ . Thus a game for φ is played with roles reversed, and if the defender of $\varphi \rightarrow \psi$ fails to successfully attack φ , then a game for ψ is played with the original role assignment. Here again, the decreasing environment is associated with a role reversal.

Now we turn to quantifiers. The traditional way of interpreting restrictive relative clauses (RRCs) in construction with quantifiers is to eliminate an RRC in favor of a conjunction, if it is attached to an existential, and in favor of a conditional, if it is attached to a universal. This is based on the idea that *Some Y who Z is W* has the form $(\exists x)(Yx \ \& \ Zx \ \& \ Wx)$, and *Every Y who Z is W* has the form $(\forall x)(Yx \rightarrow (Zx \rightarrow Wx))$. Hand (1994) develops a method which interprets such RRCs differently, and (unlike the traditional method) assigns them categorematic meanings of their own. The idea is as follows.

The first move in the game for (15) is the Verifier's selection of an instance b for the quantifier.

$$(16) \quad X - [\text{some } Y]_i [\text{who}_i Z - t_i - Z'] - W$$

Then a "tangent game" is played for the RRC $\text{who}_i Z - t_i - Z'$, where the instantiation of the *wh*-quantifier must be the selected individual b . The tangent game continues for the sentence $Z - b - Z'$. The player who selected b is the Verifier of the tangent game. Note that in this case the RRC occupies an increasing environment, and the Verifier of the original game is the Verifier of the tangent game. Assuming that this player wins the tangent game, the players now return to the original game, which continues on the sentence $X - b - W$. (If no individual is available who satisfies the RRC, then (15) is vacuously false, as we would expect of an existential quantification.)

When the environment of the RRC is decreasing, things are different.

$$(17) \quad X - [\text{every } Y]_i [\text{who}_i Z - t_i - Z'] - W$$

The game for (17) starts with a selection b by the Falsifier. Then attention turns to the tangent game on the RRC, in which the player who selected b is the Verifier. Thus a reversal of roles occurs. If the game for the RRC is won by its Verifier, then attention returns to the original game, in which the original roles are restored and play proceeds on $X - b - W$. (Thus (17), a universal quantification, is vacuously true if no individuals satisfy the RRC.)

Not all decreasing environments are to be treated by means of tangent games. The second coordinate of *no* is decreasing, but no tangent game is involved. Rather,

the players reverse roles in the original game, after a tangent game has been played on the first coordinate. In this way, *No Y is Z* is interpreted as a universal quantification with a negative predicate.

I believe that role-reversal treatments of decreasing environments are generally possible, though I know of no general argument to this effect. It is a suggestive observation, however, that truth, which is what the Verifier's moves hope to show, is preserved in the direction of increase (i.e., entailment preserves truth), while falsity, which the Falsifier hopes to demonstrate, is preserved in the direction of decrease (converse entailment preserves falsity).

It appears that in the cases to which I have applied it, the GTS-Vendlerian account can explain why polarity *any* manifests as \exists , though much work remains to see whether this is in fact the case. The situation is exactly as we would expect, on a Vendlerian account. There really is no fundamental semantical distinction between polarity *any* and generic *any* – both are just plain old *any*. The two different manifestations are due to the Vendlerian character of *any*'s sole meaning.

6. Carlson's problem

Carlson (1981), an ambiguiist, has observed that certain cases of distributional overlap between generic and polarity *any* are not ambiguous after all. (As an ambiguiist, he does not introduce metalinguistic considerations into the cases of alleged ambiguity discussed earlier, but simply assigns the universal readings of the ambiguous sentences to generic *any* and the existential readings to polarity *any*. This is possible because the earlier examples are also cases of distributional overlap.) In each of the following, he finds only an existential reading, despite his expectation to find an \forall/\exists ambiguity.

- (18) (a) For anyone to leave the room now would be a disaster.
 (b) Bob ran faster than anyone did.
 (c) Bob is unlikely to kick anyone.
 (d) Shooting at anyone ought to be illegal.
 (e) For Bob to eat anything now would be impossible.

Note first that in each of these, *any* occurs in a decreasing environment, the allowed site of polarity *any*. In each case, however, *any* is modifiable by *almost* and *nearly*, a test for generic *any*. Why, then, are there not \forall -*any* and \exists -*any* readings for (18a–e)?

These data are grist for any unitarian's mill. The obvious explanation for the fact that none of these is semantically ambiguous between universal and existential readings is that semantically, there are not two different kinds of *any*. Having registered that happy idea, I am obliged to say something about how the GTS-Vendlerian account predicts the right readings for these sentences. Unfortunately,

I am not able to bring GTS to bear very much, because all of these involve a phenomenon which has not been treated by GTS theorists and which I do not know how to treat game-theoretically. Each of the sentences involves predicating some quality of a proposition, fact, or event – the sort of thing correlated semantically with an *S* or an *S'*. The grammatical subject of (18a) is *for anyone to leave the room now*. (18b) is a comparative relating *Bob ran* and *anyone did (run)*. The D-structure of (18c) has the predicate *unlikely* attached to the complement *Bob to kick anyone*. The subject of (18d) is *PRO shooting at anyone*, and the subject of (18e) is *for Bob to eat anything now*.

It is not clear that Carlson is correct in claiming that (18a–e) have only existential readings. Here are some reasonable paraphrases of them.

- (19) (a) DISASTER($\exists x$)(*x* to leave the room now)]
 (b) ($\forall x$)FASTER(*Bob ran*, *x ran*)]
 (c) UNLIKELY($\exists x$)(*Bob to kick x*)]
 (d) OUGHT-TO-BE-ILLEGAL($\exists x$)(*PRO shooting at x*)]
 (e) IMPOSSIBLE($\exists x$)(*Bob to eat x*)]

In each case, I have given an existential paraphrase when it seemed natural. No doubt an existential paraphrase of (18b) is possible, but none seemed natural.

Consider (19c). A Vendlerian account of this *any* seems ready to hand, and even a GTS-Vendlerian story can be imagined. The Verifier defends assigning high probability to the statement, and MAX and MIN must start the game by swapping roles, since *unlikely* is negative. Then MAX attacks an assignment of high probability to the embedded statement, by playing its semantical game. Thus \exists -*any* and the decreasing environment. A similar story can be imagined for (19e). (19b) is universal, and the Vendlerian account is straightforward. I don't know how to treat (19a) and (19d), but three out of five is not bad. The cost is not as high as that paid by Carlson's account, anyway. He holds that generic *any* is always \forall , polarity *any* is always \exists , so these cases of distributional overlap ought therefore to be ambiguous, but they aren't. Carlson admits that he "must leave this as the central problem that is to be accounted for if [his] programmatic sketch of [an ambiguous] analysis of *any* is to succeed" (1981, p. 20). I have given reasons to think that a GTS-Vendlerian analysis of *any* can solve this problem. On my account, these examples are unambiguous because there are not two *anys*.

7. Imperatives and *any*

I use Hilpinen's (1986) elegant GTS treatment of imperatives. The important difference between imperatives and indicatives for our purposes is the following. Semantical games for indicatives begin with MAX having the role of the Verifier. This

is the formal analogue of the pragmatic fact that speakers commit themselves to the truth of their assertions by asserting them. Semantical games for imperatives, however, begin with MIN having the role of the Verifier. This codifies Hilpinen's observation (in turn developing an insight of John Searle's) that

In the case of an assertion the speaker is responsible for the fit between the world and the words, but in imperative discourse this responsibility belongs to the hearer: he must bring about the fit [between words and world] by his own actions, and has to suffer penalties for a failure to do so. The speaker's words provide a standard against which the hearer's actions are to be compared and evaluated. Consequently it is natural to regard the hearer as the winner of an imperative game if his actions match the imperative, that is, if the atomic sentence reached as the outcome of the game is true. (Hilpinen, 1986, p. 183; *his italics*)

Let us focus on imperatives free of negative elements, for instance (3a,b), repeated here as (20a,b).

- (20) (a) Take any apple.
 (b) Take every apple.

It is clear that *any* is not universal in (20a), despite its lack of specificity. The imperative (20b) requires the listener to take all the apples, but (20a) allows her to take just one. In (20a), *any* appears to be existential. Given the important difference between indicatives and imperatives mentioned above, it is easy to explain why (20a) and (20b) differ in meaning. In the game for (20a), choice of an apple is offered to MIN, who is the Verifier. In the game for (20b), the universal quantifier *every* refers the choice of an apple to the player with the role of the Falsifier, namely, MAX. Since *any* brings about a selection by the player with the role of the Verifier, *any* is in this case existential.

Still, *any* means the same thing in imperatives that it means in indicatives, and its meaning is just that it is interpreted in the course of semantical game-playing by a selection performed by MIN, whichever role this player happens to have at the time. Hand (1989) discusses this issue of an operator's having the same or different meanings in imperatives and indicatives.²

² In that paper, I mistakenly distinguished indicatives from imperatives as follows.

What difference there is in meaning between the assertion and the command is not a matter of sense, ...; rather, it is a difference of force, and this difference entails that in verifying the assertion, the individual who asserts it is to embody player [MAX], while in determining the satisfaction of a command by an action, it is the addressee who embodies player [MAX]. (Hand, 1989, p. 269)

I now hold that the addressee always corresponds to player MIN, and the difference between indicatives and imperatives is instead a matter of whether MAX or MIN assumes the role of the Verifier at the start of play.

8. Concluding remark

Having already emphasized the complementary advantages of my analysis over universalism and existentialism on one hand and over ambiguity on the other, I shall not return to that topic, but turn instead to a consideration mentioned early in the paper: the apparent uniqueness of GTS as a semantical framework able to give a Vendlerian account of *any*.

My claim is not that other semantical frameworks cannot accommodate the Vendlerian nature of *any*, but that they cannot do it naturally. It is simple enough in any semantical theory to introduce a property that quantifiers may possess – call it the Vendler property – and to stipulate that quantifiers having the Vendler property are to be interpreted as a universal in positive contexts in indicatives and as an existential in negative contexts in indicatives and in positive contexts in imperatives. Having done so, it may then be claimed that this treatment has the advantages I have claimed for mine: it is unitarian, since it attributes to *any* a single meaning (constituted by the Vendler property), and it need not ascribe scopal misbehavior. However, this approach would be intolerably *ad hoc* in any semantical framework I know about, other than GTS, since the Vendler property would have been introduced solely for the purpose of allowing the theorist to claim the two advantages mentioned. That is, the introduction of the Vendler property would not be theoretically well motivated.

The Vendlerian character of *any* diagnosed in my account, on the other hand, is extremely well motivated theoretically. Those aspects of the GTS apparatus to which I appeal are central to the whole GTS enterprise: the presence of two players who must make selections when quantifiers are interpreted, the necessity of roles which the players adopt and sometimes exchange in the course of play, and the interpretation of negation as a matter of role-swapping. Indeed, the semantical possibility of Vendlerian quantifiers might well have been noticed by GTS theorists prior to the discovery of any actual Vendlerian quantifiers, though to the best of my knowledge it was not. My point is that the semantical resources needed for a Vendlerian account were already present in GTS, hence there is nothing *ad hoc* in the account.³

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CHAPTER 8

Default Semantics, Pragmatics, and Intentions*

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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This paper concerns the division of labour between semantics and pragmatics, discussed mainly with the example of definite descriptions. The status of *what is said* and *what is communicated* is subject to debate in the current literature. Three major standpoints can be distinguished in the semantics/pragmatics boundary dispute: (i) traditional semantic ambiguity; (ii) Grice's unitary semantics complemented with conversational implicatures, and (iii) underdetermined semantics in which pragmatic aspects of meaning contribute to what is said. In this paper, I suggest a fourth solution and defend its superiority over the other views. My approach advocates a *default semantics* in which semantic representation is established with the help of intentions in communication. Intentions come in various types and strengths, including their default values. The default value triggers the default semantics for an utterance, whereas the departures from the default are signaled by the context. The approach is compatible with the *pragmatic intrusionism* of dynamic semantic theories such as Discourse Representation Theory where no distinction is made between semantic and pragmatic domains and semantics is unitary. My approach supplements dynamic semantics by an ordering of possible interpretations on the scale of salience, indicated by a principled account of intentions in communication.

“The theory of utterance-type meaning should be
a theory of default interpretation.”
Levinson (1995, pp. 109–110)

1. Outline

1.1. *What is said*

This paper is a voice in the discussion concerning the distinction between semantics and pragmatics. It concerns mainly, although not exclusively, sentences with definite descriptions and demonstrates how an adequate interpretation can be provided without evoking the idea of underdetermined semantic representation.

The status of *what is said* is still subject to debate. Grice suggested that in the case of utterances which exhibit an ambiguity of interpretation that cannot be attributed to the lexicon or grammar, *what is said* should be regarded as the same in the two readings, whereas the conversational implicatures are different (Grice, 1978). It has been argued since then that *what is said* is better seen as semantically underdetermined (Récanati, 1989b). So, for instance, the difference between the referential and the attributive reading of definite descriptions is placed on the level of what is said because what is said is underdetermined (see Récanati, 1989b, p. 300). The degree to which semantics is reduced and pragmatics enlarged remains in dispute (cf. Cole, 1981, p. xiv). Three possible standpoints have been distinguished concerning the semantics–pragmatics interface. In this paper, I would

like to suggest a fourth one and defend its superiority over its rivals. First, there is (i) the traditional position of semantic ambiguity advocated, among others, by Russell. Next, there is (ii) Grice's postulate of unitary semantics complemented with conversational implicatures. There is also (iii) a view that advocates underdetermined semantics according to which a pragmatic aspect of meaning contributes to what is said. The distinction is made here between the semantics of natural language and the semantics of the conceptual representation system, with pragmatic factors bridging the gap (see Carston, 1988). *Pragmatic factors* are understood as contextual information plus the pragmatic principle of cooperation, including an account of speaker's intentions. The processes of supplementing the semantic representation is called *completion* (or *saturation*) and *expansion* (or *strengthening*; Bach, 1994a; Récanati, 1989b).

The fourth view which I am proposing advocates non-ambiguous semantics achieved through the interaction of the speaker's intention with the logical form of the expression. The problem of ambiguity does not arise because intentions 'intrude' into the semantic representation. The view is thus compatible with the *pragmatic intrusionism* of dynamic-semantic approaches such as Discourse Representation Theory (henceforth: DRT; Kamp and Reyle, 1993), where pragmatic factors 'intrude' into a unitary semantic domain. There is one, discourse-level representation, to which syntax, semantics and pragmatics contribute. However, whereas DRT treats all possible resulting representations equally, the account proposed here orders them on the scale of salience and predictability from the default one to the furthest departure from the default.

The problem of semantic representation which is present in one way or another in the heterogeneous set of examples involving quantifiers, negation and other logical connectives was brought to the fore and sustained by intricate argumentation by Wilson, 1975; Kempson, 1975, 1977, 1979, 1986; Zwicky and Sadock, 1975; Atlas, 1979, 1989; Kempson and Cormack, 1981; Sperber and Wilson, 1986; Carston, 1988, 1996; Récanati, 1989b, 1993, 1994; van Deemter and Peters, 1996; Turner, 1997, to name only a few out of a vast number of publications advocating in various ways and to various degrees the sense generality thesis or at least trying to exorcize unwanted ambiguities (here: Grice, 1978; Horn, 1972, 1985, 1988, 1989; Levinson, 1988; Atlas and Levinson, 1981). I suggest that the same methodological effect can be gained by using a device which, unlike the idea of underdetermined semantics, enjoys an indelible psychological plausibility. This role is performed by the technical notion of *intentions* in communication which direct the utterance interpretation at the correct semantic representation. I suggest an unambiguous and unitary semantics, obtained essentially along the lines of Kamp's (1984) dynamic semantics. However, I also attempt to resolve the problem of the various possible interpretations of such 'interpretatively ambiguous' sentences which are assigned to them by Kamp's DRT. I suggest using the idea of intentions and the principle of economy with respect to the postulated levels of interpretation (see Section 2.1).

The paper focuses on definite descriptions but it also signals the possibility of accounting for other interpretatively ambiguous utterances, although, unlike for definites, no firm proposal will be offered for the rest.

Definite descriptions allow for two interpretations: the referential one, which makes them akin to proper names, and the attributive one, which makes them about whoever or whatever undergoes the description (Donnellan, 1966). So sentences of the type (1) have two readings.

- (1) The best architect designed this church.

The ambiguity is best seen as pragmatic (see, e.g., Kripke, 1977), although the exact placement of the pragmatic component in this analysis differs between current approaches (cf. Schiffer, 1995). According to tradition (iii), definite descriptions have a unique, underspecified semantic representation which is further pragmatically enriched into a propositional form before being assigned a truth value. In this paper, I shall use the term ‘underspecified’ for the semantic representation which is not yet truth-evaluable, and ‘underdetermined’ in a wider sense of semantic representation in need of either further *completion* before it becomes truth-evaluable or *expansion* when it is truth-evaluable but intuitively in need of further elaboration before it renders correctly what is said.¹

Another preliminary terminological clarification is due at this point. *Semantic representation* and *logical form* are not distinguished for the purpose of utterance interpretation. It is argued that intentions in communication help establish the semantic representation of the utterance and hence the semantics and pragmatic components are interwoven. Both terms are needed, though. Whereas in utterance interpretation we talk about semantic representation or, in DRT terms, discourse representation, in analyzing sentences we talk about logical form as the output of grammar. Hence, there can be more than one logical form corresponding to one

¹ This idea of a unique but incomplete semantic representation is also said to account for the ambiguities of the sentences of the type (10) with the sentential connective ‘and’ which is ambiguous between logical conjunction and the temporal or consequential conjunction:

- (10) They got married and had a baby.

(see, e.g., Carston, 1988). Here the semantic representation is not underspecified: it is truth-evaluable but, on the underdetermined semantics standpoint, the proposition requires further expansion. The underdetermined-semantics account has also been applied to other interpretatively problematic cases. Discussion on the status of the ambiguities of sentences of the type (2) and (13) which allow for more than one logical representation (see, e.g., Kempson, 1979; Kempson and Cormack, 1981; Carston, 1996) has evoked much disagreement over the past two decades and focused on exorcizing semantic ambiguity and applying the idea of underdetermined, including underspecified, semantics instead.

- (2) The present king of France is not bald.
(13) Two examiners marked six scripts.

Sentences (2), (10) and (13) frequently appear in the literature on the subject. They are said to exhibit a mixture of cases including underspecified and complete semantics, i.e., a need for either completion or expansion. See Sections 1.5–1.7.

sentence but only one logical form/semantic representation corresponding to an utterance. As a result, the notorious expression *semantic ambiguity* will be used (if at all) in the context of an epistemological commitment to the effect that a sentence has more than one semantic representation. This commitment will be rejected in agreement with the underspecified-semantics theorists, although no commitment to underspecified semantics will be made here. *Logical ambiguity* is used with respect to sentences which allow for more than one representation in the language of first-order logic. This term does not involve any epistemological commitment: as it will be acknowledged and argued further on, the fact that a sentence can be ascribed a logical form does not yet mean that it has this logical form. Kempson (1986, p. 79) says that "... a sentence is ambiguous if with respect to a single set of circumstances it can be both true and false". The unifying property of sentences analyzed in this paper is what I call an *interpretative ambiguity*. 'Interpretative ambiguity' is used as a loose, non-theoretic term (as far as it is possible), meaning a difficulty with assigning a unique interpretation to an utterance. So, for the present purpose, the category of departure for assigning an ambiguity is an utterance, not a sentence and it is the interpretative ambiguity that will interest us.

My main overall conclusion is that the analysis of definite descriptions in terms of intentions suggests that the semantic ambiguity/underdetermination dilemma disappears in a dynamic model of semantics when the latter is enriched with a principled account of intentions in communication.

1.2. *Semantic ambiguity?*

Let us first have a look at some standard examples of alleged semantic ambiguity from the literature, beginning with negation.

- (2) The present king of France is not bald.

In (2), the picture is this. The sentence has two readings corresponding to the external and the internal negation. According to the first, there is no king of France and the proposition is true, and according to the other merely the property of being bald is negated and the sentence is sometimes seen as lacking truth value (Strawson, 1950). In this paper, the contentious issue of presupposition will not be discussed as it is not directly relevant for the concept of interpretative ambiguity which preoccupies us here. According to the standard Russellian interpretation, the sentence is ambiguous due to the fact that negation can take a wide or narrow scope. But the outcome of the discussion mentioned above has been a general consensus that since the two types of negation are not logically independent (Kempson, 1979), semantic ambiguity should be exorcized and replaced with pragmatic processes that lead from the semantic form, containing general, unspecified sense (or one, more general reading, here opinions vary, cf. *ibid.*) to the establishment of a propositional form. This representation is an 'enriched' (in the informal sense) variant

of a semantic representation to which we can assign truth values. Applied to (2), this theory renders a semantic representation which is unspecified for the scope of the negation operator and which is further filled in with necessary information according to Atlas's witty pastiche of Kant: "Pragmatic inference without sense-generalization is blind, but sense-generalization without pragmatic inference is empty." (Atlas, 1989, p. 124; see also Atlas, 1979, and for discussion Turner, 1991). In other words, in interpreting an utterance we do not select among the available readings but rather construct one interpretation by means of pragmatic inference in the given context.

On the underdetermined semantics account, sentence (2) does not have a single set of truth conditions that could be assigned to it prior to assigning an interpretation. The sentence can be used to express two different senses, and thus it is often regarded as semantically indeterminate (cf. Bach, 1987b, p. 202): it is said to have one, general, underdetermined meaning. The two readings are then obtained on the level of use, i.e., the level of pragmatics.

The same solution is often claimed to hold with respect to propositional attitude constructions, i.e., sentences of the type in (3):

- (3) Mary believes that the present king of Sweden is bald.

This sentence is interpretatively ambiguous between the two readings: the transparent one, paraphrasable as in (3a), and the opaque one, paraphrasable as (3b):

- (3a) Mary believes of the present king of Sweden that he is bald.

- (3b) Mary believes that there is a king of Sweden and that he is bald.

Bach (1987b, pp. 206–207) argues that the distinction holds only for sentence *use* rather than for the semantic interpretation. He argues that although sentences exemplified here by (3) can be assigned two representations in first-order logic that differ in the scope of the existential quantifier applied to 'the king of Sweden' (ranging over the belief predicate and being within the scope of the belief predicate, respectively), this fact does not suffice to infer that this sentence *has* these two logical forms and, a fortiori, that it is ambiguous. I am inclined to agree with the latter claim but, by the same non sequitur, I would argue that this consent does not yet mean that semantic representation has to be underspecified as to the particular meaning and as to truth conditions. Before reaching the verdict on the semantic representation of such interpretatively ambiguous sentences, it is necessary to investigate whether there are any general operational principles that would render one interpretation as primary, unmarked, and thus that would under normal conditions function as the standard semantic representation of the sentence. This paper aims at presenting a convincing positive answer to this question, an answer which is, moreover, compatible with the principle of Modified Occam's Razor advocated by Grice (1978), to be introduced in what follows.

First, some more terminological clarification. Underdetermined sense (and underdetermined semantic representation) can be easily explained with reference to (3). When an expression has two readings, such as a transparent and an opaque one in the case of (3), caused by two different occurrences of a definite description, the explanation of these two readings is said *not* to be provided by the logical form, i.e., by the scope of the existential quantifier: the narrow scope reading can still be either transparent or opaque, depending on the particular occasion of its use. And, if there is no such logical explanation of the ambiguity, there is no semantic ambiguity either. Now, those who exorcize the ambiguity view take a big leap from there to the claim that the semantic representation of (3) has to be indeterminate, underspecified, unfit to be assigned truth conditions (see Bach, 1987b, pp. 206–212). They say that only the *uses* of an underdetermined sentence have truth conditions, and thus the study of reference belongs to pragmatics (1987b, p. 61). My standpoint represents a middle ground between the ambiguity thesis and the indeterminacy of sense: in my view, a sentence of the type (3) has a unique semantic representation that corresponds to the standard, default reading of the sentence and is achieved with the help of intentions that ‘intrude’ in the semantic representation. This representation can be assigned truth conditions and is fully operational on the level of sentence use in some (default) cases. As I shall demonstrate, other cases can be accounted for by the non-standard workings of intentions in communication.

The controversial idea of semantics based on default interpretations will be shown not to be so controversial when derived from the idea of default intentions and default reasoning, attained by a straightforward borrowing from, among others, Grice (1978) and Bach (1984). This clandestine agreement with both sides on the issue of indeterminacy versus unity will be further pursued in Section 2.

In short, I shall agree with the rejection of semantic ambiguity of negation, expressions of propositional attitude and definite descriptions but take a further step to demonstrate that even the level of underdetermined semantics can be disposed of by means of the influence intentions exert on the semantic representation. The main message is that the ambiguity/underdetermination dilemma is only the result of a wrongly posed problem.

The current picture is this: whereas lexical and syntactic ambiguities result in sentences which can be unrelated and cannot be traced back to one meaningful representation, in the case of other interpretative ambiguities there are said to be rules that lead from a general meaningful representation to one or the other fully truth-conditionally specified proposition. This is the idea of parsimony best spelled out by Grice (1978) as *Modified Occam's Razor* (henceforth: MOR):

MOR: Senses (linguistic meanings) are not to be multiplied beyond necessity.

(see also Récanati, 1989a, 1989b, 1994). Here the question arises as to what role this methodological principle plays in utterance interpretation. Is it merely a tech-

nical device which ensures that theorizing does not get out of hand and uses unifying rules rather than postulating differences wherever possible, or is it also a cognitive principle of utterance interpretation as performed by the hearer in the act of conversation? Either way, it is problematic as a fundamental device. In order to alembicate its real status, it is necessary to look first at the principle itself.

2. The parsimony of levels of semantic representation

2.1. *Levels of senses*

The first difficulty stems out of the scope of MOR. It can be inferred from Grice's writings, such as his analysis of the sentential connective 'and' (cf. Grice, 1975, p. 24; 1978, p. 46) that if a sentence is syntactically complete and can express different propositions in different contexts, then it is semantically ambiguous. On the other hand, whenever possible, the differences in interpretation should be attributed to the context of utterance rather than to the sentence. In this way the proposition can be preserved as an unchanged entity across contexts of interpretation and what is actually communicated is retrieved or constructed thanks to the notion of implicature (cf. Récanati, 1989b, 1994). However, as is clear from the dispute on ambiguity sketched in Section 1.1, one can claim that context aids in establishing the proposition (or: propositional form) to a much larger extent than Grice originally suggested (see Levinson, 1988; Carston, 1988; Bach, 1994a, 1994b).

Roughly, the idea is this. Sentences such as (4)–(7) have to be given some 'finishing off' so that the intended meaning can be recovered.

- (4) You are not going to die.
- (5) I haven't eaten.
- (6) Everyone must wear a costume.
- (7) Steel isn't strong enough.

(from Bach, 1994b, p. 268). (4) requires 'expansion' to include the specification of the situation, like 'dying of the injury', (5) requires a temporal specification, (6) a restriction of the quantified expression 'everyone', and (7) requires 'completion' concerning the purpose for which steel is under scrutiny. All this requires a pragmatic process that gives rise to a full, intended proposition. This propositional form is called by Bach (1994a, 1994b) 'implicature' (a term preferred to Sperber and Wilson's (1986) 'explicature' since, although it relates to what is said, it does not relate to what is said explicitly). MOR is satisfied as what is said can be resolved from the semantic representation with the aid of the context. My problem with this picture concerns only the place for semantic representation. In other words, must it be underdetermined and postulated in separation from the pragmatic

processes that expand and complete it? I hope to dispel this generosity about the levels of sense with the help of intentions. The above sentences are incomplete and thus they are meaningful only in context. But this fact does not yet guarantee the viability of the leap from the (4)–(7) case to the epistemological commitment that semantics is underdetermined.

As we can see from examples (4)–(7), there are many processes in addition to reference assignment filtered into the slot between the semantic and the propositional representations (cf. also Levinson, 1988; Récanati, 1994). From a methodological point of view, the question arises as to what advantage is gained from maintaining an underdetermined semantic representation, further filled in to produce a form with a truth value. There is a reading of interpretatively ambiguous sentences in which the distinction between the semantic form and the truth-evaluable propositional form is redundant. This reading will be demonstrated to be the default one. Hence, there would have to be a strong reason to postulate the distinction. There do not seem to be any such reasons. It is possible to give an equally adequate account of a sentence meaning in terms of a sole representation. This strengthening of MOR can be spelled out as follows:

POL: Levels of sense are not to be multiplied beyond necessity.

which I shall call Parsimony of Levels (POL). This principle boils down to a restriction on postulating the two levels of sentence interpretation: semantic representation (here equated with logical form) and propositional representation as separate aspects of meaning (sense), when they are not discernible with cognitive plausibility. If what is said is rendered as a sentence that is logically unambiguous, the truth conditions (or, generally, conditions of success) can be read off the semantic representation. If it is ambiguous, then the standard language usage may provide an interpretation that is the sole candidate for the interpretation in the relevant circumstances. As was pointed out in Section 1.2, Bach (1987b, p. 207) correctly observes that “Logicians and linguists commonly assume that because a sentence can be represented by a certain logical form, it *has* that logical form. This is a non sequitur.” The sentence may either have *one* of these forms on the unmarked interpretation, or, in theory, it might have none and progress from a general sense to a fully specified one in either of the ways delineated by its ambiguity. I shall argue for the first alternative. If what is said was interpreted as a form that is transitional between the semantic form and a truth-conditionally identifiable content (see Carston, 1988), then POL would be violated and, in the most radical case, i.e., the one involving underspecification requiring both completion and expansion, we would have to distinguish between (1) semantic form, (2) ‘propositional’ content of what is said, and (3) the ‘true’ propositional form which contains all the necessary information for the assignment of truth value. ‘Necessary’ rather than ‘all’ because otherwise the propositional form would contain too much information. Here we require a separation between truth-conditional and non-truth-conditional meaning by shifting some implicatures below the required line. In other words, we

require only that part of pragmatic information which contributes to truth conditions. This much is widely acknowledged and we need not flog the dead horse.² After all, if any meaning that is not derived by linguistic decoding was implicated (as Grice claims, see Carston, 1988), then in many cases we would not be able to arrive at a single proposition since decoding need not necessarily always precede inferential processes. Or even, as Escandell-Vidal (1996; personal communication) claims, decoding is always preceded by inferential processes which result in building a 'schema' or 'frame' ready to admit decoded information.

The idea behind POL is that full propositional representation can be equated with the semantic representation. This proposal is tested here on definite descriptions. But this formulation of the idea is only a tip of an iceberg and thus requires detailed justification. The core lies in intentions in communication as discussed by Grice (1969) on the one hand, and the tradition in the speech act theory on the other (cf., e.g., Searle, 1983, 1992; Bach and Harnish, 1979). The resolution is presented in the following section, followed by a presentation of its application to some chosen examples.

2.2. *The types of intentions*

This account makes use of three types of intentions: primary (reference-securing), communicative, and informative. The simplest case of referring is when the syntactically and semantically simplest expression is used with the intentions to *communicate* that the referent is to be recovered and to *inform* about this very referent (adapted from Sperber and Wilson's (1986) distinction). But there is an important point to be raised with regards to Sperber and Wilson's account of intentions. Grice (1957, 1969) says that the hearer understands the speaker's utterance by recognizing the speaker's intention (cf. Bach and Harnish (1979, p. xi) "... a communicative intention has the peculiar feature that its fulfillment consists in its recognition". See also discussion in Bach (1987a)). Sperber and Wilson (1986) add here the distinction between the communicative and the informative intention, the second embedded in the first. If communicative intention is envisaged in the light of the theory of relevance, then what is communicated is entirely hearer-dependent. However, it is possible to conceive of conversation as a process of assumption creation performed *in-between* the speaker and the hearer, assigning to the hearer a more responsible role than just recovering the already existing assumptions. In fact, Bach and Harnish treat communication as a cooperative process, based on Grice's idea of speaker's intentions addressed at the hearer. I am not sure whether,

² Cf.: "A number of philosophers have contended that Grice completely overlooked the fact that inferential processes of essentially the same sorts as those involved in implicature enter into determining what is said." Bach (1994a, pp. 269–270). In other words, what is implicit in what is said differs from implicature *sensu stricto*.

if the above is true, one has to dispose of the *default role* of communicative intention in constructing meaning or make it intersect with the informative one (see Bach (1987a): fulfillment of communicative intention *is* its recognition. N.B., Bach and Harnish (1979, p. 7), do not distinguish an informative intention; they talk about the illocutionary-communicative intention being guaranteed by the ‘communicative presumption’: that whenever the speaker says something to the hearer, he/she is doing so with some (illocutionary) intention). Communicative intention is defined as making it “mutually manifest to audience and communicator that the communicator has this informative intention.” (Sperber and Wilson, 1986, p. 61). It is certain, however, that the hearer is also invited to *construct* meaning rather than merely *recover* it (Levinas, 1961; Jaszczolt, 1996b), and thus that communicative intention may matter to a lesser degree in communication: making it manifest that ‘this is what I want to say’ can perhaps be overridden by a principle of how exactly the speaker and the hearer contribute to the meaning that is being established *between* them in the process of conversation. But this topic has been extensively discussed elsewhere (Jaszczolt, 1996b; Bird, 1994).

2.3. *The degrees of intentions for definite descriptions*

On the referential use of definite descriptions, the intention to refer is present and is derived from the intentionality of the underlying mental act. Intentionality is a property of mental states that makes them *about*, or *of* objects and states of affairs (cf. also Searle, 1983, 1990a). Only some mental states are intentional: beliefs, hopes, fears are, as opposed to nervousness or elation that are not. Now, some beliefs (thoughts) are externalized by means of language. This is how intention becomes a property of linguistic acts (by being, so to speak, ‘inherited’ from mental acts). Hence we can say that some intentional states are linguistic. On uttering a sentence, the speaker intends a particular object or person to be salient to the hearer and this intention constitutes the internal, undetachable *property* of the constructed representation.

Intentionality of securing a referent ensures that semantics is atomistic, *about* the real world, and that *acts* of meaning are acts of experience of the real world, about the objects of the world, and primarily aimed at the objects of the real world (in agreement with Husserl, 1913). Intentionality so perceived incorporates the workings of *intentions* in communication, since language is one of the vehicles of thought (*pace* Lyons, 1995; see Jaszczolt, 1992, 1996a). The speaker’s intention to communicate something and to inform the hearer about something also rely on this primordial intention to secure the referent. So, the claim is this:

PI: The primary role of intention in communication is to secure the referent of the speaker’s utterance.

I distinguish a special kind of intention that performs the reference-securing task and call it the primary intention (PI), allowing, naturally, for the instances where

this intention is absent either by force of the type of the expression used or by force of particular circumstances. The claim goes back to the nineteenth-century idea of intentionality, put forward by Brentano (1874) and developed by Husserl (1900–1901), although the connection between contemporary studies of intentions in communication and the phenomenological tradition is not always acknowledged and not always appreciated. It was Husserl (1913) who claimed that acts of consciousness are directed toward a real object. These objects trigger a semantic interpretation.³ Meaning is seen here as social, established in the process of social, meaning-giving acts. Knowing the object depends on fulfilling intentions either by thought, by perception, or by imagination. As language is one of the possible vehicles of thought (Jaszczolt, 1996a), intentions also govern its use.

Naturally, not every sentence concerns an individual. But whenever a possibility of a referential interpretation is viable, it is secured by the referential intention which is assumed by the hearer to be present. This is the general idea behind PI. It has to be pointed out that the claim made in PI is considerably stronger than the current speech act/intentionality tradition allows for. Bach (1987b, p. 52), when discussing propositional attitude contexts, admits that when the speaker expresses an attitude towards an individual, the referential intention must be present. However, this claim does not aid the indiscernibility problem of referential and attributive readings of definite descriptions. Other works in the intentionality tradition follow suit. The general idea is this: as long as communication is said to incorporate only the need to inform or perform any other illocution (using illocutionary intention) on the part of the speaker, assumed by the hearer to be present, then the fact that the hearer normally comes up with *one* interpretation remains unexplained. After all, whether one subscribes to the underspecified semantics view or not, one has no explanation of the fact that although there is more than one interpretation of an utterance of the type (1), the hearer does not hold all of them in the mind, pondering which one to choose. Referential intention, when present, seems to explain this fact of instantaneous interpretation.

Now, having suggested this device for the cognitive level of interpretation (intentions), it seems plausible to maintain it for the semantics. Some linguists would not see a problem with having a technical device in their semantics that does not serve a cognitive explanation, i.e., does not have a psychologically plausible equivalent.⁴ Hence, they see no danger in multiplying levels of explanation and adding underdetermined representations. On the other hand, the price to pay for semantic parsimony may be high as we may have to revindicate some long abandoned ideas of speech act theory such as the default correlation between an utterance and a

³ What Husserl called *objectifying*, meaning-giving acts. See Jaszczolt (1992, 1996a).

⁴ Victoria Escandell-Vidal (personal communication) says: "...I would probably still prefer a two-layered model without claiming any psychological reality (...), at least until a way out of the problems of the notion of speech act is found." and: "...what you gain in psychological verisimilitude gets somewhat lost in theoretical elegance; and vice versa, what you gain in theoretical elegance you lose in psychological reality."

speech act. However, referential intention makes only a small demand in this contentious revival: there is no direct correlation between sentence types and speech acts. After all, PI allows for nonreferential interpretations which perform the same speech act as the referential reading of the same utterance (cf. Example 1). Moreover, the problem under discussion concerns only the class of representatives and the issue of indirect speech acts remains free to be interpreted at the reader's will: to be either rejected outright, or left untouched. All in all, if intentions contribute to the semantic interpretation, they render the reading that depends on the presence or absence of the referential intention and this fluctuation has an indirectness flavor itself. More on this topic in Section 2.4.⁵

In order to see how this idea works for definite descriptions, it is necessary to establish what the objects of intentions are. In (1), when the speaker is taken to be talking about a particular, known individual, e.g., Christopher Wren, the referent is easily secured. But when the speaker talks about whoever happened to have designed the church and who is otherwise unknown to him/her, then intentions involved seem to be aimed at a person but fail to provide an identifiable referent. And, to take the third interesting case: one has to establish what is the object of the utterance in which the speaker is obviously referentially mistaken. This would be the case if in (1) the speaker was taken by the hearer to be talking about John Smith thinking mistakenly that Smith designed the church. Since the social act (speech act) secures reference, Smith should be the referent. However, one may also say that since intentionality is social, it reflects the use of language in a linguistic community and thus that intentions proceed towards the bearer of the name or description because this is what they normally do for a hearer who is not referentially mistaken. But let us suppose that the hearer is not sure whether the speaker meant Smith or Wren, i.e., the true architect of the church. This confusion may be engendered by the prior assertion of the speaker to the effect that Wren is known to the speaker as an eminent architect.

The explanation of these difficulties proposed here is this:

DI: Intentions come in various sizes, i.e., they allow for degrees.

I call this claim a principle of the degrees of intentions (DI). The principle accounts for the ordering of the three readings of definite descriptions in the following way. In the case of (i) a referential use of (1), intentions are the strongest and the referent is secured outright, as if *by default*. In the case of (ii) a referential mistake,

⁵ Bach and Harnish (1979, p. 93) say on this point that there is no standard strategy for recovering the illocutionary intention. My addition to this minimalism is to claim that although there is no recipe for interpretation, there is one for standard interpretation in sentences that involve the multiplicity of senses, secured by the interaction of intentions, and, where applicable, by the referential intention. Bach (1987b, p. 66) recognizes the referential intention in the case of indexicals: their meaning depends on the referential intention of the speaker. From here there is only one step to saying that if things get complicated in interpreting informationally fuller referring expressions (descriptions, proper names), the hearer also resorts to the intentions of the speaker.

intentions proceed towards two different objects, one along the path of 'social intentionality' and one along the 'individual path'. By 'social intentionality' I mean here the route which would be representative of an average native speaker who refers correctly, in agreement with the common wisdom. An 'individual path' represents the intentionality as it really occurs in the particular case of a particular speaker who can be referentially mistaken. The gap between them is reduced by utilizing contextual clues (what Husserl calls *horizon*) and one intended referent is established. In the case of (iii) an attributive use of (1), referential intention sets off as normal, but does not reach any particular referent. We can say that here we deal with the weakest type of intention. The intention is still there: on the attributive reading, the speaker still intends a referent to exist, whoever it might be.

I developed this proposal in detail in Jaszczolt (1997) but the particulars are irrelevant for this study of the semantic and the propositional forms of an utterance. The basic idea is that the semantics allows for the intervention of pragmatics to various degrees. It is essentially a dynamic semantics, exemplified in the 'intrusionistic' models of Kamp (1984); Kamp and Reyle (1993); and Heim (1988) but differs from them in supplementing POL with an ordering of resulting interpretations. In other words, *intentions in their strong form secure the referent by their intrusion into semantic representation. The weaker the intentions, the more information has to be read off the rest of the semantic representation*, the ultimate case being the attributive use of (1) where it is the semantic representation alone that secures the referent, whoever he or she might be.

2.4. *The primary intention and default semantics*

It is widely acknowledged that sentence meaning ultimately has to be analyzed in terms of intentions and other psychological states (Grice, 1989; Sperber and Wilson, 1986; Récanati, 1993). My account subscribes to this claim. Bach (1987b, p. 195) says that the distinction between referential and nonreferential occurrences of referring expressions (the category which includes for him definite descriptions) is drawn pragmatically and so is the distinction between transparent and opaque interpretations of propositional attitude constructions. In other words, the reading is specified on the level of speaker intention. In this section I further develop the claim that intentions come in *degrees*, that they help to establish the semantic representation, and that the basic intention is the one to secure a referent in communication. This intention guarantees the default semantics for definite descriptions and propositional attitude sentences. In order to fully grasp the role of intentions in communication, it is necessary to refer to the history of the idea that precedes Searle's (1983) idea of intentionality on one hand, and Grice's (1969) definition of meaning as complex intending on the other. I shall demonstrate that intentions in communication cannot be separated from intentionality of cognitive processes and that the accounts just mentioned are partial and insufficient for the purpose of

dealing with representations in utterance interpretation. Searle's account conforms to the so called 'double intentionality': that of speech acts and that of physical actions. I am going to claim that this division is unfounded and it is more advantageous to be fully committed to intentions as psychological states per se, i.e., intentions that allow the hearer to 'read information off the world' and avoid the anfractuosités of argumentation for intentionality of speech acts.

Intending means essentially acting out of one's beliefs and desires. Grice observes that for a speaker to mean something by uttering a sentence he/she has to intend the hearer to [1] produce a particular response (cognitive or physical, as Strawson (1964) emphasizes), [2] think that the speaker intends that the hearer produces a response and [3] produce the response on the basis of thinking that this is what the speaker intends (see Grice, 1969, p. 92). Except for some sophisticated situations where there is a need to step down to the *n*th level sub-intentions (Grice, 1969), the schema seems to work, although in the case of conventionalized procedures, such as bidding in a game of bridge, conventions are said to do the job and secure the uptake of the intention automatically (see Strawson, 1964). Whether one agrees with the role of conventions so assigned or not, it is conspicuous that one essential element is missing in these accounts and that is the explanation of what exactly it means to secure a response, according to what procedure and by means of what information. An account of speaker meaning that espouses intentions is wasted if stopped before letting the idea of intentions perform its task. And the task, as I see it, can extend to resolving the interpretative ambiguity problem. In order to do so, we have to say more about intention as securing the referent in conversation.

What is communicated by the utterance of (1) may differ depending on the context of interpretation. In order to account for this difference, one could follow either of the two procedures: either follow the radical pragmatics path and approve of the generality of sense, or construct an account of intentions securing reference. In order to avoid being between Scylla and Charybdis, a convincing decisive argument is required. Both traditions are acclaimed to enjoy a certain psychological plausibility, one derived from Chomsky's account of Universal Grammar and the other from the idea of phenomenology including the intentionality of acts of consciousness. Both pertain to innate abilities of the mind, with the different scope attributed to linguistic phenomena.⁶ As we have seen in Section 2.1, if we begin the account of utterance interpretation with the specification of intentions, we obtain, in most cases, a truth-evaluable level of propositional form as the first-level sense because the referent is secured. In other words, POL is satisfied. The level of an underdetermined semantic representation is then excluded by definition: securing reference is the most natural and expected process in utterance interpretation performed at an early stage, after some initial pre-decoding inferences, and neces-

⁶ This is not a primary concern of the paper. For an account of the vehicles of thought see Dummett (1991); Jaszczolt (1992) and forthcoming.

sarily simultaneously with decoding.⁷ Necessarily, because securing the referent is automatic on hearing the referring expression, just as the quantifier analysis is automatic on hearing an indefinite description. And this tendency to secure a default, unambiguous interpretation has to be captured by any cognitively plausible theory of communication. Kamp and Reyle (1993, pp. 288–304) call it a general tendency of a type of expression that has to be captured by construction rules for discourse representations, i.e., rules for building their intrusionistic semantic representations of utterances. The conjecture to be made at this point is that the underspecified semantic representation may lack psychological plausibility: normally, intentions secure the object of the discourse and the unique reading of an utterance. It remains to be demonstrated that it is also theoretically redundant – a task that can be only signaled rather than concluded in the present proposal.

In other words, the fact that a speaker means something by uttering a sentence is equivalent to saying that he/she utters it with “...the intention of inducing a belief by means of a recognition of this intention” (Grice, 1957, p. 384). First of all, the speaker intends the object or person spoken about to be easily individuated by the hearer. This is the main preference in communication and the main point of reference for evaluating the role of referring and quantified expressions in utterance interpretation (Levinson, 1987). It has been remarked about Donnellan’s view that “...in some cases, we use the description to get to the referent and then throw away the description as it were” (Levinson, 1988, p. 47). The hearer does so in the case of a referential interpretation of a mistaken description. In a sense, he/she does so in all cases of referentially used definite descriptions. He/she gets to the object as if *by default*: normally, people talk about known, existing entities. Thanks to the presence of such preferences in conversation, we can say that this process belongs to dynamic, context-sensitive semantics. Levinson gives here a convincing example to illustrate the thesis that enriched semantics is preferable to post-semantically, pragmatically resolved reference:

(8) The ham sandwich is getting restless.

The definite noun phrase refers, obviously, to a client who ordered a ham sandwich. Levinson claims (after Sag, cf. 1988, p. 62) that denotations should be allowed to change *within* semantics, for instance along the lines suggested by Kaplan’s (1989) distinction between character, which is a function from contextual indices to contents, and content itself (cf. also Jaszczolt, 1997, footnote 4). I discuss this issue in more detail in Section 3.

As is well known, instead of talking about reference, Donnellan suggests talking about reference attribution by the speaker. He adds that the referent should be “historically or causally connected to the speech act”, although the theoretical explanation of this link is not provided (see Donnellan, 1970, p. 356). A theory of the

⁷ As Escandell-Vidal (personal communication) observes, pure decoding may have no place in this account.

recovery of the intended referent along the lines of a theory of intentionality can fulfill this role. After all, who (if anybody) the speaker referred to is a matter of the speaker's intentions, or rather their recognition by the hearer (Donnellan, 1966, p. 297). And so is the use of a definite description, referentially or attributively. So, the ambiguity of sentences such as (1) is neither properly semantic nor pragmatic.⁸ It is a semantic ambiguity only when we accept a 'static' semantics that lists the truth-conditional impact a description can have in all sorts of contexts, including intensional ones such as (3). The seeming interpretative ambiguity is accounted for by the dynamic semantic representation that allows for default interpretations of the utterance. The utterance is normally unambiguous and its interpretation proceeds towards the default reference, unless some contextual impediments stop it from doing so.

Degrees of intentions, default interpretations and the balance of costs and effects are all signaled in Bach's (1984) account of *default reasoning*. Bach says that default reasoning means "inference to the first unchallenged alternative" (1984, p. 38), i.e., to the first sense of the utterance that springs to the hearer's mind and is not immediately refuted in another thought. Default reasoning is *automatic*, it relies on *generalizations* and *stereotypes* of everyday life. People normally take it for granted that the interpretation that springs to mind is correct; no further reasoning process is involved. They do so in accordance with the rule that makes them calculate costs and effects of making judgements and decisions. Jumping to conclusions is such a cost-avoiding and effective default. (As Bach says, it is effective because the hearer knows when to jump to conclusions and when to think twice.) Equipped with PI and DI, we can also say that defaults correspond to the strongest intentions, unclipped by any conditions governing their fulfillment. The interpretation proceeds as referential because people normally talk about other individuals: we *can* jump to conclusions, there is no need to think twice unless the situation makes us do so.

Now, Bach observes that in order to work out this sketch into a full theory of default reasoning one needs an account of beliefs and intentions because beliefs and intentions influence reasoning in an important way. He also briefly suggests accounting for the "degree or strength of belief and intention" (1984, p. 49). In effect, the present investigation is such a proposal of an account of intentions in which the *degrees* of intentions are delineated and combined with the three *types* of intentions postulated here in accordance with PI and DI. All this has to be juxtaposed with a correct account of calculating costs and effects in the process of utterance interpretation.

⁸ In one of my earlier papers (Jaszczolt, 1993) I claimed that in Polish there are lexical and syntactic means of distinguishing between talking about a known and an unknown individual in belief reports (*de re* and *de dicto*). However, the use of this distinction is also pragmatically-driven and constitutes in itself strong evidence for the default status of the *de re* interpretation of belief statements and belief reports.

It is also worth observing that the idea of the default referential interpretation is compatible with Levinson's (1987) proposal of minimization and with proceeding in utterance interpretation from his 'I-principle', i.e., saying the necessary minimum, towards the 'Q-principle', providing sufficient information for intention recovery. Shorter, more general reference forms are used as a default and only if more information is required, Q-principle is applied and the referring device is elaborated. The idea is also compatible with Sacks and Schegloff's (1979) principle of minimization and the principle of recipient design. The latter concerns communicative intentions and says that the speaker uses a reference form that allows the hearer to recognize the referent.

The intention-based account of meaning illustrates one general point remarked upon by Thomason: if intending to assert p does not differ from intending to assert q , then the meaning of p and q is the same. Intensionality of meaning and intensionality of intention go hand in hand (see Thomason, 1990, p. 349). As Thomason observes, Grice's maxims are too loose to account for intentions in conversation. He suggests a theory of shared plans and goals. Thomason hopes for a theory of default reasoning that would be on a par with conversational implicatures. It is my belief that such a theory has to be based on intentions in communication, default reference, MOR, POL, and above all parsimony of processing, controlling and controlled by gained information.

The act of uttering a statement and the content of the statement are the two entities that were confused in philosophical texts for a long time, with a strong emphasis placed on the latter aspect (see Smith, 1990, pp. 31–32). The aftermath of this confusion is still present. It is only in Bolzano's, Brentano's and Husserl's writings where an act of saying and a concept became distinguished on psychological grounds. As Husserl says in his early work (1900–1901), meaning is created in intentional acts. So, in our terminology, the propositional form depends on the physical and psychological acts of utterance production and comprehension. Intentions and other psychological states are, so to speak, *read off* the world, as Reinach says (Smith, 1990, p. 54) and they provide vital information for the construction of propositional form. If we followed Searle's theory of speech acts and his arbitrary, conventional constitutive rules, we would have to rely on social and methodological rules for utterance interpretation. This standpoint would not comply with the POL principle: a superfluous level of explanation would be created between the reality and the act of saying. Neither would it provide a tool for dealing with what Searle calls indirect speech acts, as was discussed above. By analogy, Searle's idea of intentionality is not consistent with POL either: it takes a long route by avoiding metaphysical commitments. Instead of merely comparing intentional states and linguistic expressions and postulating arbitrary sincerity conditions, one should specify what *role* linguistic expressions play in intentional states. Otherwise, one would have to have a theory of transfer of the conditions of satisfaction from the mind to the utterance, which is not only superfluous, but plainly ontologically, methodologically and epistemologically false. Searle talks here about the

double level of intentionality: the utterance is intentional because conditions of satisfaction of a speech act (dependent on its essential condition) make it express a psychological state and the psychological state is itself intentional. So, intentionality of linguistic expressions is inherited from the intentionality of corresponding psychological states by means of the imposition of conditions of satisfaction (see Searle, 1983, pp. 27–28; Harnish, 1990, p. 188). However, since intentional states can be regarded as ‘psychological equivalents’ of utterances as they express the ‘directedness’, the relation towards the world (what Searle calls the ‘direction of fit’), utterances *are* speech acts, i.e., units of propositional content plus illocutionary force, matched on the psychological level by representative content and the psychological mode of its presentation (see Baumgartner and Klawitter, 1990, p. 213). Instead of double intentionality, we easily arrive at a notion of a speech act as an example of an intentional act. Intentions are read off the situation, not off any artificially imposed conditions. Finding defaults in reasoning is another, albeit expected, bonus achieved by pursuing intentions in communication. This is, naturally, only the essence of the criticism, utilizing the POL to exorcize constitutive rules. Further elaboration would require a separate paper.

2.5. Application of POL and DI to negation

I do not have a separate account of negation but I do have an account of definite descriptions which makes the solution for (1) also available as a possible solution for the scope of negation in (9). Russellian readings are presented in (9a) and (9b) and they reflect the difference in the scope of negation.

- (9) The king of France is not bald.
- (9a) $\exists x (\text{King of France } (x) \ \& \ \forall y (\text{King of France } (y) \rightarrow y = x) \ \& \ \neg \text{Bald}(x))$
- (9b) $\neg \exists x (\text{King of France } (x) \ \& \ \forall y (\text{King of France } (y) \rightarrow y = x) \ \& \ \text{Bald}(x))$

where ‘ x ’ is an individual variable (cf., e.g., Neale, 1990). However, these representations are redundant in utterance interpretation. The speaker uses the sentence with the referential or the attributive reading and these are not represented in the above logical forms. The referential reading assimilates the description to the status of a proper name and, for our purposes, can be represented as (9c) where ‘ k ’ is an individual constant standing for the person who is the king of France (see Donnellan, 1966).

- (9c) $\neg \text{Bald}(k)$

Russell's account does not provide for this reading and is thus standardly rejected.

What interests us here is (9c). This referential reading is the presumed default interpretation as it corresponds to the strongest primary intention. The suggestion that this interpretation is the default one conforms to the intuition that the sentence is problematic: either outright false, or neither true nor false due to not having a referent – the choice is at the discretion of the informed reader. In a sense, the scope of negation comes later: the attributive reading with the narrow scope of negation is the middle case as far as the strength of intentions is concerned, followed by the weakest intentions in the case of the attributive reading with the wide scope of negation. The intrusion of intentions in the semantic representation guarantees nonambiguity and a determinate, complete semantics.

2.6. Application to other sentential connectives

At present, there is no convincing intention-based account of sentences of the type (10) where the temporal 'and' is meant.

(10) They got married and had a baby.

We can conjecture that the strengthening of the meaning of a logical connective corresponds naturally to the strongest communicative and informative intentions. Therefore, as a default, 'and' will mean 'and then' or 'and as a result'; 'if' will render 'iff' and 'or' will stand for the exclusive disjunction. In such an interpretation, the contextual effect is strongest, the intention to inform of the situation is strongest, and if it really is the default, the processing effort is smallest. If we took the 'weaker' sense to be the default, ambiguity would flourish and the corresponding intentions would be present in their inhibited form. The third option, that of no defaults, is eliminated by force of MOR, POL and because the interpretation tends to be secured by the hearer, as confirmed by common-sense everyday observation. But these are only tentative proposals. After all, in (11) we would be in need of postulating a rule for non-sequentiality and non-consequentiality of 'and' – perhaps coming from the fact that it is immediately diaphanous to the hearer that no sense-connection is meant between the conjuncts.

(11) He is a novelist and has three children.

This solution to the division of labor between semantics and pragmatics has already been in the air: Récanati indicates its possibility by saying that "...what is said is identified on an intuitive basis" (1989b, p. 309), or, more formally, proposes his Availability Principle:

"In deciding whether a pragmatically determined aspect of utterance meaning is part of what is said, that is, in making a decision concerning what is said, we should always try to preserve our pre-theoretic intuitions on the matter." (Récanati, 1989b, p. 310).

It is an intuitive prediction of the speaker's intentions that guides the hearer in interpreting the utterance (see also Carston, 1988, 1998).

2.7. *Application to numerals*

I believe numerals can prove to conform to the rule of intentional, default interpretation sketched above. It is commonly held that, e.g., 'three' in (12) is logically bound to mean 'at least three', and pragmatically bound to mean 'at most three' or 'exactly three' (cf., e.g., Horn, 1985; Levinson, 1988; Kempson and Cormack, 1981).

(12) Max has three children.

The default interpretation can be postulated along the lines of POL enriched with an account of intentions. In this interpretation, 'three' means 'exactly three' as this is the case of the strongest informative intention – and, of course, the highest informative content. By definition, quantifier expressions of this sort do not exhibit a primary intention. However, in my account all three types of intentions allow for degrees in agreement with the DI principle. Meaning 'at least three' is also possible; let us imagine a context where a parent who has three children qualifies for social benefits. The object of the predication is, however, only partially revealed and intentionality is weaker. Here we utilize PI principle to the effect that the primary intention takes precedence over the other two intentions; after all, it has a different cognitive status and a different methodological motivation. The same conclusion is easy to obtain on an intuitive basis. So, if the postulation of the strength of intentions incorporated into semantics is on the right track, then perhaps they can be seen as standing in a fixed inverse relation to processing effort. Sentence (13) would then gain the interpretation in (13a).

(13) Two examiners marked six scripts.

(13a) Exactly two examiners marked exactly six scripts.

This does not help much with the resolution of the relative scope of the quantifiers and with the collective and distributive reading. Still, this preliminary delimitation of the number of readings seems to be a plausible step. Next, the fact that the addition of 'each' would be meaningful seems to suggest, in agreement with the Cooperative Principle, that its omission is significant (see footnote 1) and points towards the collective reading. Kamp and Reyle (1993, p. 321) point out that any satisfactory paraphrase of a collective reading would have to refer to the fact that the effort of the individuals is combined – either physically or in its outcome. They quote examples where the collective reading is obligatory or at least is strongly preferred and argue that the distributive reading is best regarded as obtained through an optional further step after the collective reading has been

obtained (see Kamp and Reyle, 1993, pp. 320–330). The intention-based account succumbs to this strength of the collective interpretation and makes it a default by attributing a primary referential intention to a set, thus incorporating collective intentions which are not reducible to individual intentions. One can plausibly argue that collective intentions can be shown to interact with the other three dominant intentions in communication and strengthen them by strengthening the primary, referential intention. As a result, the default interpretation is produced and it is the collective one. The route to the default interpretation can be directly derived from the interaction of intentions presented in the case of definite descriptions, with the addition of the collective intention. Any further concerns about the status of the latter fall outside the focus of this discussion and are, after all, largely a matter of an epistemological commitment. At the moment, this is as far as the account leads, extending Searle's (1990b) view on collective intentions.

2.8. Indefinite descriptions

Throughout this paper I have been discussing and in effect contesting the idea that underdetermined semantic representation always functions as a cognitively viable step in the analysis of interpretatively ambiguous expressions. The MOR dictates uniform semantics and accounting for any differences in meaning by means of pragmatic principles – be it Gricean, neo-Gricean or relevance-theoretic. Definite descriptions, i.e., definite noun phrases in sentences of the type (14), allow for two interpretations: referential (about, e.g., Jones) or attributive (about whoever Smith's murderer may be, see Donnellan, 1966).

- (14) The murderer of Smith is insane.

POL and DI guarantee the interpretation of the utterance which is either the default one or differs from it if the departure from the default is signaled in the context.

Indefinite descriptions are sometimes claimed to have even more readings, e.g., (15) is sometimes said to have a specific reading which is postulated as a reading intermediary between the referential and the attributive and it describes the case where the speaker does not intend the hearer to individuate the person (Ludlow and Neale, 1991; Larson and Segal, 1995).

- (15) A friend of mine from Oxford paid me a visit.

The use of an indefinite signals that the identity of the object spoken of is not relevant for the purpose of the conversation. Indefinites do not induce the primary intention and are not logically ambiguous. If it is so, then the use of an indefinite serves the purpose of saying either that

(1) the identity of the referent is unknown to the speaker or that

(2) it is known to the speaker but irrelevant for this particular discourse either because the hearer would not know the referent anyway or because whoever it is, it is only the indefinite description that matters.

Therefore, rather than postulating manifold ambiguities, MOR and POL suggest two interpretations: specific and nonspecific, which is after all a well acknowledged and established distinction (see Kamp and Reyle, 1993). So, indefinite descriptions can be used specifically or nonspecifically. The specific use signals that the speaker is talking about a particular, known individual or object and that this individual or object is either taken to be new to the hearer or its identity is irrelevant for the conversation. The nonspecific use signals that the speaker is talking about an unknown individual or object. The difference between the specific and nonspecific use is truth-conditionally decisive in the examples where it triggers the ambiguity of scope as in (16) (from Kamp and Reyle, 1993, p. 279), where on one reading there is a particular problem that preoccupies them all, and on the other reading every politician has some problem or other that preoccupies him or her.

(16) A problem about the environment preoccupies every serious politician.

However, we can say that the ambiguity of scope is engendered here by the quantified expression 'every politician'. Therefore the argument about the truth-conditional impact of the reading is not decisive. Hence, Ludlow and Neale's (1991) distinction into *referential*, *attributive* and *specific* use of indefinites appears rather contentious. In order to postulate it, the authors had to interweave a change of perspective from that of the recognition of the speaker's intentions by the hearer to that of the speaker's background knowledge. Attributive and referential uses are presented as straightforward cases of recognition of the speaker's intentions by the hearer. In the specific use more than the intentions has to be recognized: the hearer knows that the speaker knows the person talked about and that the speaker does not intend to communicate this information. Ludlow and Neale distinguish here the speaker ground, the proposition meant and the proposition expressed. However, if the account of communication is to be given in terms of PI and the communicative and informative intentions, then the change of perspective is unnecessary – not to mention that it is methodologically inappropriate. The aim is to analyze the process of utterance interpretation and the establishment of meaning by the hearer and *not* the differences between the speaker's background knowledge and speaker's meaning. The perspective is that of the hearer recovering the speaker's intentions and thus of the language *use* rather than that of the totality of cognitive processes involved in utterance interpretation. In other words, there are only two readings that matter: specific and nonspecific seen as *intended as specific and nonspecific*. The totality of the speaker's thoughts and attitudes is irrelevant. The confusion is still rife in the literature but it is important not to run the two perspectives together.

In utterances with indefinite descriptions, when accounted for by means of primary, communicative and informative intentions, it seems natural to admit that the nonspecific interpretation is rendered as a default: indefinites are not referring expressions; the primary intention is missing and this fact allows the hearer to read more information off the semantic representation than would be the case when primary intention was in operation, i.e., in the case of definite descriptions. The semantics is not ambiguous: indefinites do not exhibit referential properties. They can, however, be specific. Even then their aim is not to secure a referent but rather by their means the speaker communicates to the hearer an event or state, at the same time making the hearer alert to the fact that no stronger statement was necessary or possible.

The specific and nonspecific readings can be explained as follows: the thought of the speaker exhibits intentionality because all acts of consciousness do. This intentionality can be stronger or weaker. However, the utterance does not exhibit the primary intention of securing the referent. The primary intention does not interact with the informative and the communicative intentions. This situation can be engendered either by the weakness of the primary intention of the mental act (the nonspecific reading of the indefinite) or by the conflict between the primary intention of the mental act and the informative intention (the specific reading; the referent may not be of interest in the conversation). In any case, the utterance is permeated with the primary intention of the speaker's thought and the specific or nonspecific interpretation is established between the speaker and the hearer. To repeat, the nonspecific interpretation occurs in the case where, according to the hearer, the intentionality of the mental state of the speaker is the weakest, i.e., it fails to reach the object. The specific reading is rendered when the speaker's thought is recognized as strongly intentional but the utterance fails to inherit this primary intention due to the interaction of the communicative and informative intentions. In other words, the underlying thought is either general and the primary intentionality is unrealized, i.e., does not reach the object, or concerns an intentional object but is not communicated at its face value.

2.9. *Interim conclusions*

Let us take stock. Ludlow and Neale (1991, p. 184) assert that the uses of indefinite descriptions do not prove the existence of a separate referential interpretation. That is true. And so is the claim that 'donkey'-sentences of the form as in (17) are not ambiguous between the singular and plural interpretation of the description (cf. Ludlow and Neale, 1991, p. 198).

- (17) Every man who buys a donkey vaccinates it.

But proceeding to assigning one of the possible readings has to be more fine-grained, level-neutral, and allow for the dynamism of semantic representation and,

a fortiori, for default interpretations.⁹ Sense need not be unspecified, it just needs to be *constructed in situ* as default sense or departures from the default, predicted by the recovered degrees of intentions. Only in this way will one avoid multiplying the levels of senses beyond necessity.

I have suggested that in the case of definite descriptions intentions are strongest when the speaker communicates a proposition about an individual known to the hearer (cf. Section 2.3). The hearer automatically processes the utterance as if it concerned a particular, known individual. In (1), this case corresponds to the referential reading. *Nota bene*, both the communicative and informative intention (of Sperber and Wilson, 1986) are in their strongest form: the particular person is spoken of and it is intended that this information is recovered by the hearer. If, on the other hand, the speaker communicated a proposition about whoever fits the description, the informative intention would make the process of reference assignment stop at a certain stage: either at the very beginning, if the informative intention was strongly supported by the communicative one, or later on, if the communicative intention was weaker. This is due to the interaction of the primary, communicative and informative intentions. The strongest intentions correspond to the smallest effort in processing the message on the part of the hearer. We can say that this is the default situation: the message is optimally informative, minimally demanding in assumption recovery, and thus the situation is optimally advantageous for securing relevance. Intentionality, directedness at a referent, is secured without going through an intermediate, underspecified stage in utterance interpretation: the person or object is *intended* and this message ‘automatically’ gets through to the hearer.

To sum up: semantics remains uniform, unambiguous, but fully truth-conditional thanks to securing a unique reading of a sentence by means of intentions incorporated in the dynamic framework. Rather than underdetermination and underspecification resolved later on by pragmatics, what we get is default interpretations. Only by accepting this standpoint can we explain the attributive use and referential mistakes of definite descriptions, as well as the multiple logical ambiguity of numerals (see Kempson and Cormack, 1981).¹⁰ The alternative readings are simply the weaker cases of intentions: primary, referent-securing intention in the case of definite descriptions, and informative intention in the case of quantified expressions. They ‘mix in’ various degrees of information read off the semantic form

⁹ There are serious implications here for the distinction between being a Russellian and being a referentialist. See (Neale, 1990). But the opposition may after all boil down to being founded on a terminological mismatch. For arguments in favor of such a reconciliation see (Récanati, 1993).

¹⁰ N.B., in (13), the speaker could say:

(13') Two examiners marked six scripts *each*.

which helps to demonstrate that this reading is not the default one of (13). On the other hand, in (13''), ‘between them’ sounds redundant:

(13'') Two examiners marked six scripts *between them*.

and intentions in order to render a truth-evaluable representation. Indefinites are not ambiguous in this way and one need not resort to DI to discuss their reading. The semantics is thus flexible and *dynamic*: the semantic representation can be strengthened or weakened by intentions and the process is not temporal. In the default case there is no underdetermination as a step in the ladder. Kamp (1984) and Kamp and Reyle (1993) allow for the dynamism to be achieved by contextual specification; Récanati (1994) opts for Methodological Contextualism. And as it has been demonstrated here with a help from intentions, the dynamism can be taken 'higher up' in the 'semantics-proposition-implicatures' schema, to affect the semantic representation. As an additional bonus, we can now observe that the ambiguity-nonambiguity dilemma disappears and turns out to be merely a terminological mismatch. More about it in Section 3.

3. Unitary default semantics: towards a proposal

3.1. *Discourse representation and cognitive representation*

In this section I am going to discuss the notion of a propositional form that constitutes part and parcel of an 'intrusionistic' dynamic semantic representation. I shall again take on board the theses of semantic ambiguity and underdetermination and demonstrate that, to a large extent, the polemic is driven by a terminological vagueness and confusion. Finally, I shall summarize the advantages of building a semantics around the idea of default interpretation.

The difficulty with defining semantic representation is engendered by the fact that there is no uniform connection between the output of grammar and the situation referred to by the linguistic string. The interpretation of the linguistic string does not undergo any strict semantic rules. But since neither does the situation itself, what is required is a restatement of the relation in more dynamic terms. The reality changes by the moves and actions of the participants and the interpretation of a linguistic string changes with more information becoming available, along the lines described by Heim's (1988) File Change Semantics where the task of the hearer is, so to speak, to construct a file and regularly update it so that it contained all the necessary information revealed by the speaker. So, for indefinite expressions the speaker starts a new file card (introduces a new discourse referent, cf. Karttunen, 1976), and for a definite, an existing file card is updated, according to the conditions specified in the semantics. Files, interpretive devices that mediate between the language and the world, perform the role of a monitor that records all the changes of the situation, including both linguistic and non-linguistic information such as that from perception and background knowledge. They do not rely on logical forms (in Chomsky's sense) but rather overlap with them since logical form contains a lot of grammatical information which is irrelevant for constructing meaning. Lappin (1991) makes an even stronger claim that the logical form is

redundant as a level separate from the S-structure to satisfy MOR and, as we can infer, POL as well. One of the main arguments for this standpoint comes from the ambiguity of the scope of quantified noun phrases that do not seem to require a unified LF in order for one or the other semantic representation to be assigned to them (cf. Lappin (1991, pp. 310–313). See also Kempson (1991/92) on how syntax and semantics are intertwined). So, even within the domain of syntactic analysis, logical form may be overly informative.

Changes in the situation may affect the truth value of an utterance. They cannot be recorded after the propositional form has been constructed because they affect the truth-conditional meaning of the utterance. Heim's solution evades this difficulty by introducing a level on which both utterances and other sources of information write down anything that is required. Essentially the same relation between the two components is proposed by Kamp's DRT. Levinson calls this perspective 'pragmatic intrusionism': "...there is a common slate, a level of propositional representation, upon which both semantics and pragmatics can write..." (Levinson, 1988, p. 22). Pragmatic intrusionism is a more cognitively plausible model of utterance interpretation with its semantic and pragmatic aspects assigned an equally privileged status. Discourse representations are mental representations and are, so to speak, two-aspectual: they rely on model-theoretic semantics but also concern the meaning grasped by the hearer on hearing an utterance. The theory thus has to be composed of three stages: a generative syntax, rules deriving representations from syntactic constructions, and mapping from representations to a model, supplied with a definition of truth (cf. Levinson, 1988, p. 4). Logical ambiguities seem to vanish on the level of deriving a representation, thanks to the various possibilities of applying construction rules that account for the diversity of meanings (cf. Kamp and Reyle, 1993). A discourse representation shows what the world would have to be like for the sentence to be true. Its construction rules account for the introduction of new referents and adding properties (or, generally, DRS-conditions, DRS being a Discourse Representation Structure, an interpretation of a sentence or a text) to the existing referents which is essentially based on the linguistic representation. When more information becomes available as the discourse proceeds, the representations are filled in with more properties and referents (see Kamp and Reyle, 1993, p. 59).

3.2. Processing options and unambiguous representations

A DRS is true if there are individuals in the universe of discourse that correspond to the discourse referents and the conditions of that DRS predicate something that can be truthfully said about these individuals. However, the interpretative ambiguity remains here as a full-blown ambiguity of processing options: in the case of indefinite NPs, for instance, the hearer can process the utterance to render the specific or the nonspecific reading, depending on the DRS in which a discourse

referent for 'an *x*' is introduced. The appropriate reading can thus be achieved by means of choosing the appropriate order of rule application or by postulating into which DRS (in the case of embedded DRSs, or: opaque contexts) the referent is to be introduced (see Kamp and Reyle, 1993, pp. 288–293; Jaszczolt, 1998). The theory does not predict under what circumstances the hearer will follow one or the other option, but neither does it postulate an ambiguous unit or an underspecified representation. Whether there are defaults or merely contextual preferences, the process of utterance interpretation relies on the whole discourse situation that is available and avoids multiplying stages through which this interpretation must proceed. Ambiguity is present because the sets of information contributing to each of the alternative DRSs are different in various respects, both semantic and pragmatic. But it is an ambiguity of the *sentence* rather than the *utterance*. Given a sentence, the interpretation of its various utterances can go either of the prescribed ways. Given an utterance, it proceeds along one particular way because of the default interpretation which is engendered by the joint commitment, i.e., by *sharing of the discourse referents* between the interlocutors (Kamp, 1990) and, if applicable, because of overriding the defaults. According to Kamp, there are also devices of *formal and external anchors* for directly referential terms in the semantic interpretation: in order for a representation (DRS) to have truth conditions of a singular proposition, the DRS has to have a clear referent, i.e., be connected with an *entity* by an external anchor (Kamp, 1990). Kamp (1984) believes that the structures that people form during the cognitive process of utterance interpretation resemble the representations of Discourse Representation Theory. In cognitive processing, like in DRT, building an interpretation can proceed in various ways. For instance, anaphoric pronouns introduce referential ambiguities. Kamp says that background assumptions about the world help select referents in such problematic cases. Principles of inference in communication, forming intentions out of beliefs and desires, resemble principles of inference in formal logic and are applied to items with syntactic structure, i.e., logical formulas (Kamp, 1990).

Now, it seems that these items do not yet constitute a semantic representation. Discourse understanding is incremental, proceeds bit by bit and in the process it accommodates changes of the context. In our account, some of these bits are inherently equipped with triggers of intentions, and intentions prevent the semantics from being ambiguous. Instead, they secure the reading either as the *default*, strongest one or a *weaker* one when intentions are weaker. For instance, who is meant by using a proper name depends on the context – including the speaker's intentions (Kamp and Reyle, 1993, p. 62). So, in (18), the discourse referent for *a Porsche* has to be introduced in the main, transparent, superordinate DRS which corresponds to the widest scope of the existential quantifier that handles 'a Porsche'.

- (18) John doesn't like a Porsche. He owns it.

(Kamp and Reyle, 1993, p. 106). But there are no strict conditions for when this should be done. Perhaps the issue would be less complicated if intentions were fully applied in a sense of reading information off the world or the inherent lack of this process. Then the hearer can be said to arrive at default readings and consecutively weaker readings corresponding to weaker intentions. Only if this schema is of no help, true *communicative, interpretative ambiguity* arises.

The problem also arises in sentences of the type (16), (19) and (20).

- (16) A problem about the environment preoccupies every serious politician.
- (19) Every boy in Mary's class fancies a girl who Mary doesn't know.
- (20) Bill doesn't know a book that I have read during the past four weeks.

(Kamp and Reyle 1993, pp. 279, 288, 303, respectively). Different readings of these sentences owe their existence to the different scope taken by the indefinite noun phrase. Kamp and Reyle suggest here two possibilities of accounting for the phenomenon: relaxing the order of application of rules for constructing DRSs or externally *imposing* a status of a quantifier *or* a referring expression on the indefinite, according to the hearer's judgement. Since such judgement is decisive in the theory, we can infer that it has a role to play in DRS construction and as such it prevents the occurrence of an ambiguity. It does so because the (cognitive) process of DRS construction intentionally aims at *one* DRS, the one that represents the reading recognized as intended by the speaker, or, to follow the doubly-dynamic perspective (Jaszczolt, 1996b), the one [1] congruent with the intentions of the speaker but also [2] to be collaboratively achieved by the speaker and the hearer in the process of communication. So although "...the processing of indefinite noun phrases must allow for a considerable spectrum of alternatives" (Kamp and Reyle, 1993, p. 292), these are *alternatives to the default reading which is obtained by the ordinary, default application of construction rules*. The default reading of indefinites always treats them as quantifiers. There is no reference-securing intention involved which would signal direct referentiality as is the case in the default reading of definites. But this intention may be present in other non-default readings, although in competition with the informative intention for a surface appearance. It is sometimes signaled by the presence of words such as 'certain', 'particular', 'given', and relative clauses. The authors say that in such cases indefinites are processed as definites and obtain their default, referential interpretation (see Kamp and Reyle, 1993, p. 293). I have suggested that they are still processed as indefinites but the primary intention of the mental act affects the informative intention of the utterance.

Kamp and Reyle admit that they do not know how to distinguish between 'long' and 'short' indefinites and they have no good processing rule to account for this distinction. All they do is to postulate various processing options available to the hearer. However, the hearer 'chooses' the processing option *automatically* in the

context of the conversation, *not* as one of the possible two. Since there are various reasons for scope ambiguities, one cannot fit the examples into one standard mould of logical variations of scope. There is no unique rule they would conform to. Any such rule would have to be psychologically plausible and the translations from natural language into first order logic are not sensitive to this plausibility (see Kamp and Reyle, 1993, p. 304). The ambiguity is thus relegated to the level of utterance and resolved by utterance processing that relies on dynamic semantics allowing for pragmatic intrusionism. In this way the ambiguity-nonambiguity dilemma is exorcized for these cases. We can add, it is to be replaced with *dynamic semantics*, combined with *contextualism* and *intentionality*.

I have suggested in this paper that the multiplication of levels of representation in utterance interpretation can be avoided by means of recognizing intentionality and, consequently, default readings. This proposal requires a model of interaction of semantic and pragmatic information that would allow the two levels of analysis to build on each other as it is, for instance, proposed in Discourse Representation Theory and File Change Semantics (for pragmatic intrusionism see also Hausser, 1981). Retaining truth-conditional semantics is methodologically advantageous because meaning is atomistic and we do not want to become involved in the even darker realms of the totality of a person's thoughts and the inner workings of mental states (Kamp, 1990; Kamp and Reyle, 1993; Fodor, 1994). If, as in DRT, we allow nonverbal information to influence the DRs, then the truth conditions of the formed propositions can be predicted correctly. There is even room for default interpretations of descriptions because interlocutors are taken to see themselves as sharing discourse referents (cf. Kamp, 1990, p. 81). Although the inner-theoretical explanation of the phenomenon is weak there, we can propose intentions as the missing exegesis: intentions as acting out of one's beliefs and desires, and intending, at the same time, the particular object or person.

4. Conclusions

This paper is not intended to provide an ultimate solution to the problem of processing of interpretative ambiguities. Its aim is rather to draw attention to the fact that psychological plausibility and semantic parsimony should go hand in hand. Grice's principle of Modified Occam's Razor has been shown to be effective only in conjunction with a principle called here Parsimony of Levels. I suggested that, in the case of definite descriptions, the distinction between the semantic form and the truth-evaluable propositional representation need not be made, and provided criticism of some approaches that rely on underdetermined semantics. I suggested instead a Default Semantics where pragmatic information is naturally incorporated into semantic/cognitive constructs in a dynamic way, reflecting the dynamism of conversation. This approach supplements the existing dynamic semantics (e.g., DRT) by a principled account of intentions. It is argued that ambiguity can be ac-

counted for by means of introducing degrees of intentions that help construct the intended DRS, i.e., to reach the intended interpretation. All in all, in the analysis of discourse, the need for sense generality seems to disappear: there are only defaults and overridden defaults, recovered in a principled way.

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CHAPTER 9

On the Semantics and Pragmatics of ‘Identifier So’

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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1. Introduction

The mechanisms by which reference is established in discourse have been among the most well studied in linguistics. However, such studies have predominantly been focused on reference to entities¹ through the use of lexical and pronominal noun phrases. Less well studied, and indeed less well understood, is a form in English that establishes reference to an event through the use of verb phrases, specifically the form which Bolinger (1972) called 'identifier *so*', as exemplified in (1)–(3).²

- (1) In fact, in substantiating these fears, Judge Bork again essentially concedes that economic freedom is a component of the Constitution: "We already have clauses that could be used to protect economic freedom – and were *so used*." (*Wall Street Journal*)
- (2) "...and with complete premeditation resolved that His Imperial Majesty Haile Selassie should be strangled because he was head of the feudal system." He was *so strangled* on Aug. 26, 1975, in his bed most cruelly. (*Chicago Tribune* 12/15/94)
- (3) In fact, it is interesting that, in English at least, there is virtually no marking of an NP with respect to the Discourse-status of the entity it represents. Of course, if an NP is indefinite and is thereby understood as evoking something Hearer-new, we can infer Discourse-new. However, if it is not *so marked*, then, with one exception, we cannot tell from its form whether it has occurred before in the discourse. (from text of Prince (1992))

While previous works have described a number of interesting properties associated with this anaphor, none to date has succeeded in providing a comprehensive account of its use and meaning. This is perhaps not surprising, as this form is notorious for having quite a varied set of apparently idiosyncratic properties.

In this paper, we present an analysis of identifier *so* based on the informational structure of the discourse in which it is used. Drawing upon a large corpus of naturally occurring data, we show that anaphoric expressions containing *so* impose a set of constraints on the information status of their referents that is not found for any of the various types of NP anaphora in English. Furthermore, we show that different constraints apply depending on whether *so* appears in preverbal or postverbal position.

¹ Here and throughout the paper, we use the term *entities* broadly to denote the class of things that can be referred to linguistically, which, in addition to entities proper, includes events, states, propositions, and so forth.

² Throughout the paper, we use italics to mark the *so* and associated verb in discourses consisting of more than one sentence.

We then consider the event anaphor *do so* in light of our analysis. In contrast to previous approaches that treat *do so* as a highly idiosyncratic form, we demonstrate that many of its properties are afforded a compositional explanation as predicted by our more general account of identifier *so*. This explanation and a variety of naturally occurring data that provide empirical support for it put to rest any claims that *do so* imposes a parallelism constraint on the syntactic form of the clause containing the antecedent. Certain idiosyncracies do remain, however; in particular we show that *do so* amalgamates properties of both preverbal and postverbal uses of *so*.

2. Reference, information status, and discourse models

As hearers comprehend a discourse, they build a semantic model representing the entities that have been introduced thus far and the relationships that hold between them (Webber, 1978; Sag and Hankamer, 1984). They utilize a variety of information sources to accomplish this, including their knowledge store, their model of the discourse that has occurred up until the point of the current utterance, the content of the current utterance itself, and their immediate surroundings, for instance, objects currently in their view. Referring expressions vary in the signals they communicate with respect to how they should be interpreted in light of these sources of information. Here, we focus on three aspects of the information status of entities with respect to these information sources: hearer status, discourse status, and salience.

Prince (1992) analyzes information status in terms of two crosscutting dichotomies: *hearer status* and *discourse status*. From the speaker's perspective, the hearer status of an entity depends on whether the speaker believes it is known or unknown to the hearer at the time of reference; entities that are believed to be known to the hearer are *hearer-old*, otherwise they are *hearer-new*. For instance, by using the indefinite *a woman* in (4a), the speaker conveys that the hearer is not already familiar with the woman being referred to (i.e., she is hearer-new), hence the hearer creates a new referent in his/her discourse model.³ On the other hand, use of a proper name, as in (4b), conveys that the speaker believes Oprah Winfrey is hearer-old, i.e., already familiar to the hearer.

- (4) (a) I saw a woman on the subway today.
 (b) I saw Oprah Winfrey on the subway today.

³ Of course, it could turn out that the hearer was already familiar with the woman:

(i) I saw a woman on the subway today. She turned out to be Oprah Winfrey.

In such a case, the hearer will merge the representation for the newly created woman in the first sentence with that of Oprah Winfrey upon interpreting the second sentence.

In contrast, the discourse status of an entity depends only on whether it has already been introduced into the discourse at the time of reference; an entity that has been so introduced is *discourse-old*; otherwise it is *discourse-new*. Hence, produced discourse initially, both *a woman* and *Oprah Winfrey*, in (4a) and (4b), respectively, are discourse-new. In contrast, the referent of *the woman* in (5) is at that point discourse-old, since she had been introduced previously.

- (5) I saw a woman on the subway today. The woman looked like Oprah Winfrey.

Considering hearer and discourse status together, entities can have one of three information statuses: hearer-old/discourse-old (cf. *the woman* in (5)), hearer-new/discourse-new (cf. *a woman* in (5) and (4a)), and hearer-old/discourse-new (cf. *Oprah Winfrey* in (5) and (4b)). An entity cannot be both hearer-new and discourse-old, as any entity already introduced into the discourse is presumably known to the hearer from that point on.

As Prince notes, the use of a definite NP in English signals that its referent is hearer-old, whereas use of the indefinite signals hearer-new.⁴ These markings, however, do not directly reflect discourse status. For instance, definites can have referents that are either discourse-old (e.g., *the woman* in (5)) or discourse-new (e.g., *Oprah Winfrey* in (4b)). Prince makes an interesting observation about the asymmetry between the ways in which discourse status and hearer status are realized in referential NPs:

In fact, it is interesting that in English, at least, there is virtually no marking of an NP with respect to the Discourse-status of the entity it represents. Of course, if an NP is indefinite and is thereby understood as evoking something Hearer-new, we can infer Discourse-new. However, if it is not so marked, then, with one exception, we cannot tell from its form whether it has occurred before in the discourse. (Prince, 1992, p. 304)

The one exception that Prince identifies is the case of pronouns, which brings us to our third factor affecting information status, namely salience. As Prince notes:

Pronouns indicate that the entities they represent are salient, i.e., appropriately in the hearer's consciousness . . . at that point in the construction of the discourse model. Therefore, they are presumably already in the discourse model. Therefore, they are Discourse-old. However, at any point in (discourse) time, only a subset, usually proper, of the entities already evoked are salient and hence representable by a pronoun. (Prince, 1992, p. 304)

Prince claims, correctly in our view, that pronouns do not mark discourse-oldness in the way that definite, lexical NPs mark hearer-oldness; for example,

⁴ A precise characterization of the meaning and function of definiteness has proved elusive; for discussion, see Birner and Ward (1994).

even for salient entities the use of a pronoun is often optional. However, in treating all salient entities as discourse-old, Prince is including (by presumption) those entities which have yet to be actually introduced into the discourse but which are nonetheless salient due to their position in the surrounding environment. Following Prince's (1981) earlier terminology, we will henceforth refer to such entities as *situationally evoked*. Indeed, one can use a pronoun in such cases:

- (6) [Oprah Winfrey walks onto the subway]

A to B: She must be happy about the outcome of her trial.

However, we differ from Prince in that we consider only those entities that have been explicitly (that is, linguistically) introduced into the discourse to be discourse-old. At the moment when the pronoun occurs in (6), for example, Winfrey is highly salient, yet discourse-new. (Of course, after the use of this referring expression, the referent becomes discourse-old, as is the case when an indefinite NP is used to introduce a referent into the discourse via linguistic means.) As a result, we posit not only that pronouns do not directly mark discourse status, but that they imply nothing with respect to it. They simply mark for hearer-old and salient.

Finally, there is also a type of referring expression that is used to specify an entity that is, strictly speaking, hearer- and discourse-new, but is nonetheless dependent on some other entity which is discourse-old. Prince (1981, 1992) refers to such expressions as *inferrables*. Examples include familiar cases of part-whole reference such as that in (7).

- (7) He passed by the Bastille and *the door* was painted purple.

(Prince, 1992, Example 17b)

While there is no previous mention of a door at the time *the door* is uttered, the creation of such a referent is licensed by the object introduced by the NP *the Bastille*, under the assumption that the Bastille has a (main) door associated with it and that the door being referred to is that door.

In sum, we have characterized the information status of entities as consisting of three properties: hearer status, discourse status, and salience. Different types of referring expressions impose different values of these properties on their referents. None of these referring expressions, however, appears to be sensitive to discourse status.

3. Discourse properties of 'identifier *so*'

We now consider the anaphoric properties of 'identifier *so*' in light of the constraints it imposes upon the information status of its referent. Following Bolinger (1972), we posit that different constraints hold based on the relative position of the anaphor and the verb with which it is associated. These two types, which we term preverbal and postverbal *so*, are illustrated in (8a) and (8b), respectively.

- (8) Oprah spent two weeks studying law to prepare for her court case.
- (a) By so studying, she was able to handle herself well on the witness stand.
 - (b) She studied so in order to handle herself well on the witness stand.

We consider these cases in turn.

3.1. Preverbal *so*

The three examples of identifier *so*, presented above in Section 1 and repeated below for convenience, are all cases of preverbal *so*:

- (9) In fact, in substantiating these fears, Judge Bork again essentially concedes that economic freedom is a component of the Constitution: “We already have clauses that could be used to protect economic freedom – and were *so used*.” (= 1)
- (10) “. . .and with complete premeditation resolved that His Imperial Majesty Haile Selassie should be strangled because he was head of the feudal system.” He was *so strangled* on Aug. 26, 1975, in his bed most cruelly. (= 2)
- (11) In fact, it is interesting that, in English, at least, there is virtually no marking of an NP with respect to the Discourse-status of the entity it represents. Of course, if an NP is indefinite and is thereby understood as evoking something Hearer-new, we can infer Discourse-new. However, if it is not *so marked*, then, with one exception, we cannot tell from its form whether it has occurred before in the discourse. (= 3)

We first consider the constraints on information status that preverbal *so* imposes on its referent. As is generally the case for definite NP reference (both lexical and pronominal), preverbal *so* clearly requires that its referent be hearer-old, otherwise its use is infelicitous as demonstrated in (12a) and (13a); compare with examples (12b) and (13b), in which the verb appears without *so*.⁵

- (12) In fact, in substantiating these fears, Judge Bork again essentially concedes that economic freedom is a component of the Constitution:
- (a) #“We already have clauses that could be so used by opponents of the administration’s trade policy.”
 - (b) “We already have clauses that could be used by opponents of the administration’s trade policy.”

⁵ We use ‘*’ to indicate syntactic ungrammaticality, ‘??’ to indicate semantic anomaly, and ‘#’ to indicate pragmatic infelicity.

(13) His Imperial Majesty Haile Selassie was head of the feudal system.

(a) #He was so strangled on Aug. 26, 1975, in his bed most cruelly.

(b) He was strangled on Aug. 26, 1975, in his bed most cruelly.

However, unlike definite NP reference, referents of preverbal *so* must also be discourse-old. That is, its referent cannot be situationally evoked no matter how salient it is, as can be seen in (14a) and (15a):

(14) [A and B together have just witnessed Haile Selassie being murdered by strangulation]

(a) A: #He was so strangled most cruelly.

(b) A: He was strangled most cruelly.

(15) [A and B have just witnessed a vote in Congress that repealed an amendment of the Constitution]

(a) A: #By so changing the constitution, Congress is setting a dangerous precedent.

(b) A: By changing the constitution, Congress is setting a dangerous precedent.

Furthermore, as is the case with pronouns, the referent of preverbal *so* must be salient.⁶ While reference can be established to a referent introduced more than one sentence back, intervening material that constitutes a major shift of topic renders a referent inaccessible, as can be seen in (16):

(16) With complete premeditation, they resolved that His Imperial Majesty Haile Selassie should be strangled because he was head of the feudal system. They also resolved to commit a variety of other violent acts, although those would come somewhat later. Obviously, these people were very prone to violence.

(a) #Selassie was so strangled on Aug. 26, 1975, in his bed most cruelly.

(b) Selassie was strangled on Aug. 26, 1975, in his bed most cruelly.

⁶ Note that the requirement that a referent be discourse-old does not preclude cataphoric uses. As shown in (i) and (ii), both pronouns and the preverbal *so* construction can be used cataphorically to refer to entities that are being introduced within the same sentence as the anaphor itself:

(i) If you're concerned about her, I'd appreciate your visiting Mrs. Waverly this afternoon.

(ii) If you're so inclined, I'd appreciate your visiting Mrs. Waverly this afternoon.

The preverbal *so* construction can also be used in cases in which the referent might be characterized as an inferrable. For instance, in (17),

- (17) Regarding a possible Elvis Presley stamp, Postmaster General Frank notes that anyone so honored must be “demonstrably dead” for 10 years. (*Wall Street Journal*)

the use of *so honored* indicates that there is a discourse-old ‘honoring’ event, but none has been explicitly introduced into the discourse. This induces the hearer to infer one from what *has* been said. In this case, the referent – roughly “issuing a stamp with X’s picture on it” – will be inferrable as long as the hearer is willing to accommodate the inference that such an action would constitute an ‘honoring’. While interpreting this passage seems effortless, upon closer analysis one finds a rather extensive chain of inference that must be carried out in constructing an appropriate referent.

There are also instances of preverbal *so* whose interpretation is based upon a generalization of the referent, rather than the referent itself. For instance, in (18),

- (18) We have already noted that this formulaic utterance “Guess what” is virtually dedicated to doing pre-announcements, as are various extensions and variants of it, such as “Guess what I did today”, “Guess who I saw”, etc. This account of composition is only rarely available; precious few configurations of talk are *so dedicated*, and even those that are are contingent on their position. (from the text of Schegloff (1996, p. 12))

the interpretation of *so dedicated* is most likely not intended to be “dedicated to doing pre-announcements”, but instead to something more general along the lines of “dedicated to a very specific conversational function”.

Interestingly, the preverbal *so* construction can also be used when a manner of the action denoted by the verb is discourse-old, but when the action itself is not. In (19),

- (19) Public-health authorities must notify school officials when students test positive for AIDS, and corpses of AIDS victims must be *so labeled*. (*Wall Street Journal*)

there is no ‘labeling’ event explicitly mentioned in the previous discourse, nor is there an action that can be inferred as such. Instead, only the manner – here, labeling corpses *as corpses of AIDS victims* – is discourse-old. Likewise, the interpretation of preverbal *so* in (20) can be paraphrased as “treated by sending through debt-reduction programs”, and in (21) as “ordered to decline to take calls from the press”:

- (20) Only about \$20 billion of Latin America’s \$350 billion foreign bank debt is going through debt-reduction programs this year. But that’s about four times the amount *so treated* last year. (*Wall Street Journal*)

Table 1
Constraints on information status by type of anaphora

	Hearer-old	Discourse-old	Salient
Definite lexical NP	✓		
Pronoun	✓		✓
Preverbal <i>so</i>	✓	✓	✓

- (21) Most Kidder employees declined to take calls from the press yesterday saying they had been *so ordered* by management. (*Wall Street Journal*)

Given such examples, one might be led to analyze preverbal *so* as synonymous with (*in*) *that way*, and indeed the two expressions have much in common. Of course, so treating preverbal *so* begs the question of what the anaphoric properties of (*in*) *that way* are. But nonetheless there are clear differences between them, most notably that (*in*) *that way*, like definite NP reference in general, allows for referents that are situationally evoked, as can be seen in examples (22) and (23):

- (22) [A and B have just witnessed Haile Selassie being murdered by strangulation]
- (a) A: I can't believe he was strangled (*in*) *that way*!
 - (b) A: #I can't believe he was *so* strangled!
- (23) [A and B are looking at tags on corpses]
- (a) A: They shouldn't be labeled (*in*) *that way*.
 - (b) A: #They shouldn't be *so* labeled.

In addition, (*in*) *that way* is less constrained in that it can establish reference to a manner modifying a distinct event previously evoked in the discourse, whereas *so* cannot:

- (24) A: John sings beautifully.
- B: Yeah, and he writes *that way* too.
- B': #Yeah, and he *so* writes too.

To summarize thus far, the preverbal *so* construction imposes a set of constraints on the information status of its referent that is not shared by any of the various kinds of NP anaphora in English: It must be discourse-old (and, thus, hearer-old) and salient. These constraints are summarized in Table 1.

3.2. Postverbal *so*

Bolinger (1972) argues that postverbal *so*, as illustrated above in (8b), is subject to a variety of constraints that do not apply to the preverbal *so* construction. These constraints arise from a condition of 'indefiniteness', a term for which he is unable to provide a precise definition. Instead, Bolinger provides three examples of the kinds of indefinite predicates to which postverbal *so* is restricted. First, the more subjective the referent, the more indefinite it is; thus, events described in subjective, or 'value-oriented', terms will permit *so*, whereas those described in more objective, or 'physical', terms will not. To see this, compare the physical predicate in sentence (25a) (*mathematically*) with the value-oriented predicate in (25b) (*courteously*).

- (25) (a) *If you thought that the questions could be answered mathematically, why didn't you answer them so? [from Bolinger (1972, p. 180); judgments in the original]
 (b) If you thought that the questions could be answered courteously, why didn't you answer them so?

Second, predicates that refer to conditions 'already in existence' are definite and thus disallow postverbal *so*, whereas predicates that 'look to the future' are indefinite and thus permit *so*. This distinction is exemplified in (26a–b).

- (26) (a) *I want the equipment to be in proper order for tomorrow morning; please leave it so tonight.
 (b) I want the equipment to be in proper order for tomorrow morning; please arrange it so tonight.

Here, *leave* refers to a pre-existing state of affairs, and thus is definite, whereas *arrange* refers to a future state and is therefore indefinite.

Finally, verbs of saying can be either definite or indefinite depending on their degree of assertability. Predicates that involve a 'positive assertion' disallow postverbal *so* (27a), whereas those that involve a (mere) claim or an uncertainty do not (27b); furthermore the verb must be 'affirmative' (27c).⁷

- (27) (a) *I assert/declare/reveal so.
 (b) I guess/think/suppose/say so.
 (c) *I (don't) disbelieve/doubt/deny so.

In fact, there are at least two types of postverbal *so* at work in these data, neither of which patterns exactly like the preverbal *so* construction. The first type,

⁷ Note that this restriction applies to the verb itself (e.g., *I disbelieve so) rather than the larger VP or S in which it occurs (e.g., I don't believe so).

exhibited in (25) and (26), differs from preverbal *so* with respect to the information status of its referent; most notably, it permits situationally evoked referents, as illustrated in (28).

- (28) [Andy is holding a newborn baby with one hand behind her head, and shows Gregory.]

Andy: It's important to hold her *so*, because the muscles in her neck aren't yet developed.

Furthermore, as noted by Bouton (1970), the VP *do it so* can be used when the *it* specifies an event and the *so* is manner-referring, as in (29):

- (29) [John pours another martini for Mary out of the wrong side of the decanter, creating a big spill.]

Mary: You shouldn't do it so! [*do it* = 'pour the drinks', *so* = 'that way']

Here, the direct object position is occupied by *it*, specifying the event of pouring drinks, while the adverb *so* is used deictically to specify the particular manner of pouring.⁸

The postverbal *so* appearing in constructions like *guess so*, *think so*, and *remain so* is yet a different form. Unlike the manner-referring meaning just described, this *so* patterns with preverbal *so* in not allowing situationally evoked referents, as exemplified in (30):

- (30) [A and B have just witnessed Haile Selassie being murdered by strangulation]

(a) A: I can't believe it!

(b) A: #I can't believe so!

Nonetheless, the *so* of these expressions serves a function quite different from preverbal *so*. A speaker's use of *believe so* is not interpreted as an instruction to the hearer to find a previous 'believe' event in the discourse, nor is it used to refer to a manner in which the believing event is performed. Rather it is used to refer to and affirm a previous and salient proposition that serves as a valid argument of *believe*.

In sum, there are several distinct uses of postverbal *so*, none of which patterns exactly like the preverbal *so* construction with respect to its anaphoric properties. In the next section, we discuss yet another distinct form of postverbal *so*, the *do so* construction. We find that while it too does not pattern with these other forms of postverbal *so*, it does have much in common with the preverbal *so* construction.

⁸ Note that these facts contradict the claims of Williams (1977), who suggests that *so* cannot refer to situationally evoked referents solely because of its adverbial status. Cornish (1992) adopts Williams' explanation.

4. Do so

Previous accounts of the *do so* construction, illustrated in (31), have noted its seemingly idiosyncratic syntactic and anaphoric properties (Lakoff and Ross, 1966; Anderson, 1968; Bouton 1970; Halliday and Hasan, 1976; Hankamer and Sag, 1976; Quirk et al., 1985; Miller, 1990; Ward, Sproat and McKoon, 1991; Cornish, 1992; Fu and Roeper, 1993; Dechaine, 1994); however, none has managed to provide a satisfactory explanation of those properties.

(31) Bill signed the legislation, and Al *did so* too.

In this section, we provide a compositional explanation of the anaphoric properties of *do so* and show that they follow from our more general account of *so*. As background, we begin by describing the well-known dichotomy between *deep* and *surface* anaphora originally proposed by Hankamer and Sag (1976), in which *do so* was treated as a surface anaphor. We then present data that show that *do so* actually has properties of both surface and deep anaphora, and thus is not categorizable within this dichotomy. We then describe the syntactic and semantic properties of *do so*, and show that they parallel its preverbal *so* correlate, *so doing*. By considering *do so* and *so doing* to be different realizations of the same form, we show how our analysis of the preverbal *so* construction can account for the anaphoric properties of *do so*.

4.1. Hankamer and Sag's dichotomy

The earliest and best-known account of the anaphoric properties of *do so* can be found in Hankamer and Sag (1976), henceforth H&S. In their classic study of anaphora, H&S argue for a categorical distinction between so-called *deep* and *surface* anaphora. Surface anaphors are 'syntactically controlled', in that they require a linguistic antecedent of an appropriate syntactic form. Examples include VP-ellipsis, gapping, and stripping. Deep anaphors, on the other hand, only require a referent of an appropriate semantic type, and thus may be 'pragmatically controlled' (i.e., situationally evoked). Examples include pronominals and event referential forms like *do it* and *do that*.

In Sag and Hankamer (1984), this dichotomy is revised to distinguish between two types of anaphoric processes, 'ellipsis' (their earlier surface anaphora) and 'model-interpretive anaphora' (their earlier deep anaphora). The former process obtains antecedents from propositional representations, which maintain the surface syntactic constituent structure of a sentence. On the other hand, model-interpretive anaphora locates referents in a discourse model, where the representations are purely semantic in nature.⁹

⁹ For historical reasons, we will continue to use the original 'surface' and 'deep' terminology of Hankamer and Sag (1976).

The distinction between the two types of anaphora is illustrated in (32a–c). Henceforth, we will refer to the clause containing the anaphor as the *target* clause, and the clause giving rise to the referent as the *source* clause.

- (32) A peace agreement in the former Yugoslav republic needs to be drawn up.
- (a) An agreement in North Korea does too. [VP-ellipsis (surface)]
 - (b) *Jimmy Carter volunteered to. [VP-ellipsis (surface)]
 - (c) Jimmy Carter volunteered to do it. [event anaphora (deep)]

According to H&S, (32a) is acceptable because the source representation is a surface VP and is therefore retrievable from its propositional representation. By the same token, (32b) is unacceptable because the putative source *draw up a peace agreement* is not a surface VP in its propositional representation.¹⁰ On the other hand, (32c) is acceptable because *do it* is a deep anaphor, and therefore is interpreted with respect to a discourse model, in which a purely semantic representation for *draw up a peace agreement* can presumably be found.

In the H&S dichotomy of anaphora, the requirement that there be a syntactic antecedent for surface anaphora implies that the antecedent must be linguistic, i.e., that surface anaphora cannot be situationally evoked. The unacceptability of situationally evoked VP-ellipsis is shown in (33a), in contrast to the acceptability of *do it* anaphora in the same context shown in (33b).

- (33) [Hankamer points gun offstage and fires, whereupon a blood-curdling female scream is heard. Sag says:]
- (a) *Jorge, you shouldn't have! [surface] (= Sag and Hankamer, 1984, Example 5d; judgments in the original)
 - (b) Jorge, you shouldn't have done it! [deep] (= Sag and Hankamer, 1984, Example 5e)
 - (c) *Jorge, you shouldn't have done so! [surface]

Despite the superficial similarities with deep-anaphoric forms like *do it* and *do that*, H&S treat the anaphor *so*, and consequently the form *do so*, as a surface anaphor. The motivation for this classification is the fact that *do so* lacks the ability to specify situationally evoked referents, as illustrated by the unacceptability of (33c).¹¹

¹⁰ A number of researchers (Dalrymple, Shieber and Pereira, 1991; Hardt, 1992; Kehler, 1993), however, have provided numerous examples in which VP-ellipsis is felicitous despite a mismatch of syntactic form between the source and target clauses.

¹¹ Some of the VP-ellipsis data (cf. (33a)) have been called into question. Schachter (1977) provides a number of felicitous examples of VP-ellipsis with situationally evoked referents, such as (i) and (ii).

To summarize thus far, the two hallmarks of surface anaphora are: (1) that there must be a linguistically evoked antecedent, and (2) that the antecedent must be of an appropriate syntactic form. In contrast, deep anaphora only requires a semantic referent of the appropriate type, and allows for such referents to be situationally evoked.

4.2. *Do so: Neither deep nor surface anaphora*

Given the data presented in the previous section, we take the evidence that *do so* does not allow reference to situationally evoked referents to be compelling and definitive. We argue here, however, that *do so* does not satisfy the other characteristic of surface anaphora, namely the requirement that there be a syntactically parallel antecedent. An examination of naturally occurring data has turned up many instances of *do so* in which no parallel surface-syntactic VP is available. We have classified these data into five subgroups, and provide representative examples below.

Voice alternation. In each of the following examples, there is a voice mismatch between the source and target clauses: The main verb of the source clause occurs in the passive voice and the main verb of the target clause in the active voice.

- (34) ... since regardless of which bit is initially assigned, it will be flipped if more information is gained by *doing so*. [= flipping it] (from text of Magerman (1994, p. 29))
- (35) Section 1 provides the examples to be derived by Gapping, and a formulation of Gapping capable of *doing so*. [= deriving the examples] (from text of Neijt (1981))

- (i) [John tries to kiss Mary. She says:]
John, you mustn't.
- (ii) [John pours another martini for Mary. She says:]
I really shouldn't.

In a reply to Schacter, Hankamer (1978) argues (convincingly, in our opinion) that such cases are either formulaic or conventionalized, occurring only as "illocutionally charged expressions" and not generally as declarative statements or informational questions. In any case, (iii) and (iv) illustrate that *do so* does not permit such anaphora, even in the restricted contexts identified by Schacter.

- (iii) [John tries to kiss Mary. She says:]
#John, you mustn't do so.
- (iv) [John pours another martini for Mary. She says:]
#I really shouldn't do so.

- (36) As an imperial statute the British North America Act could be amended only by the British Parliament, which *did so* on several occasions. [= amended an imperial statute] (*Groliers Encyclopedia*)

Similar examples were previously cited by Dalrymple, Shieber, and Pereira (1991) in arguing against syntactic-based reconstruction for VP-ellipsis:

- (37) The formalisms are thus more aptly referred to as information- or constraint-based rather than unification-based, and we will *do so* here. [= refer to the formalisms as information- or constraint-based] (from text of Shieber (1989, p. 41))
- (38) It is possible that this result can be derived from some independent principle, but I know of no theory that *does so*. [= derives this result from some independent principle] (from text of Mohanan (1983, p. 664))

In these examples, the source clause is not of a suitable form at the surface-syntactic level to license surface anaphora in the target. However, we assume that purely semantic representations of the events denoted by these clauses are available as referents in the discourse model (where presumably the distinction between active and passive is neutralized), and therefore *do so* patterns like deep anaphora in this respect.

Nominalized antecedents. In each of the following examples, the referent of *do so* is evoked by a nominalization contained within the source clause:¹²

- (39) The defection of the seven moderates, who knew they were incurring the wrath of many colleagues in *doing so*, signaled that it may be harder to sell the GOP message on the crime bill than it was on the stimulus package. [= defecting] (*Washington Post*)
- (40) For example, in the dialogue of Figure 2, the purpose of the subdialogue marked (3) is to support the agents' successful completion of the act

¹² Some speakers find these cases to be marginal as compared to the other types of mismatches we have uncovered, and in fact it is not very difficult to construct examples in which *do so* is completely infelicitous when intended to specify a referent evoked by a nominalization. We believe that this is not due to the mismatch of syntactic form between a nominalization and a VP, but instead due to the low level of salience generally associated with the semantic representations of events evoked by nominalizations. One way to test this hypothesis is to substitute *do it* for *do so* in these examples; to our knowledge *do it* is uncontroversially believed to access purely semantic referents. Thus, (i), for instance, has a marginality similar to that of (39).

- (i) The defection of the seven moderates, who knew they were incurring the wrath of many colleagues in *doing it*, signaled that it may be harder to sell the GOP message on the crime bill than it was on the stimulus package. [= defecting]

This fact, along with the fact that *do so* is readily acceptable with other types of syntactic mismatch, suggests to us that the marginality of the examples in this section is likely due to extraneous (and independently motivated) factors, and not to a mismatch between source and target clauses.

of removing the pump of the air compressor; the corresponding Shared-Plan, marked (P3) in Figure 3, specifies the beliefs and intentions that the agents must hold to *do so*. [= successfully complete the act of removing the pump of the air compressor] (from text of Lochbaum (1994))

- (41) Even though an Israeli response is justified, I don't think it was in their best interests to *do so* right now. [= respond] (token provided by Dan Hardt)

In each case, *do so* is felicitously used to refer to an event in the discourse model, even though that event was evoked by a non-VP constituent at the level of syntax.

Split antecedents. The following examples are cases of 'split antecedents', in which the event being referred to depends on which discourse entity serves as the agent of the referent:

- (42) Fortunately, the first person to die in 1990 and the first couple to file for divorce in 1990 were allowed to *do so* anonymously. [= die/file for divorce] (Roeper (1990), cited by Dalrymple, Shieber and Pereira (1991))
- (43) What I am suggesting is that when we delay, or when we fail to act, we *do so* intentionally. . . [= delay/fail to act] (Brown Corpus, cited by Meijs (1984))

We assume that no syntactic machinery exists for copying VPs from multiple source clauses to the syntax of the target clause. The resolution of these cases is therefore presumed to be performed at the semantic level.

Other form mismatches. The following examples also display a syntactic form mismatch between the source and target clauses:

- (44) There was a lot more negativity to dwell on, if anyone wished to *do so*. [= dwell on more negativity] (*Wall Street Journal*)
- (45) With or without the celebration, Belcourt is well worth seeing, and you can *do so* year round. [= see Belcourt] (*Wall Street Journal*)

Similarly, Cornish (1992) cites (46) as a case in which the antecedent is contained within a deverbal adjectival phrase, noting that it is problematic for Hankamer and Sag's deep/surface dichotomy:

- (46) He went on to claim that the allegedly high-spending Labor authorities had, by *so doing*, damaged industry and lost jobs. [= spending highly] (= Cornish, 1992, Example 19d)

Again, the necessary event representations in these examples are presumably available in the discourse model, but the necessary syntactic VP sources – required under the hypothesis that *do so* is licensed by syntactic parallelism – are not.

These data suggest that *do so* patterns with deep-anaphoric forms in requiring only a suitable semantic referent. On the other hand, it remains the case that *do so* is infelicitous with situationally evoked referents, per surface anaphora. Therefore, *do so* cannot be appropriately characterized as belonging to either category, and we conclude that the requirement for syntactic parallelism and the ability to specify situationally evoked referents need to be distinguished in a general theory of anaphora.

4.3. Syntactic and semantic properties of *do so*

Before attempting to explain the anaphoric properties of *do so* discussed in the previous sections, we will first outline some of its syntactic and semantic characteristics, especially given its superficial similarity to other forms which nonetheless have quite distinct properties.

It is well known that in contrast to the auxiliary *do* of VP-ellipsis, it is main verb *do* that participates in *do so* anaphora. Several tests may be applied to establish this distinction. First, as noted by past researchers (Hankamer and Sag, 1976; Quirk et al., 1985; Miller, 1990; Dechaine, 1994, *inter alia*), VP-ellipsis is possible with auxiliaries besides *do*, as illustrated in (47a–c), whereas *do so* is restricted to main verb *do*, as illustrated in (48a–c).

- (47) (a) Bill signed the legislation, and Al did too. [auxiliary *do*]
 (b) Bill has signed the legislation, and Al has too.
 (c) Bill will sign the legislation, and Al will too.
- (48) (a) Bill signed the legislation, and Al did so too. [main verb *do*]
 (b) *Bill has signed the legislation, and Al has so too.
 (c) *Bill will sign the legislation, and Al will so too.

Furthermore, whereas VP-ellipsis is possible with stative referents, *do so* is limited to events, as illustrated in (49a–d) (Lakoff and Ross, 1966; Anderson, 1968; Bouton, 1970; Hankamer and Sag, 1976; Quirk et al., 1985; Miller, 1990; Dechaine, 1994; *inter alia*).

- (49) (a) Bill likes McDonald's, and Hillary does too.
 (b) ??Bill likes McDonald's, and Hillary does so too.
 (c) Al wants to be president, and Tipper does too.
 (d) ??Al wants to be president, and Tipper does so too.

Finally, as Miller (1990) notes, the *do* of *do so* does not undergo auxiliary inversion unlike the *do* of VP-ellipsis. Thus, compare the *do so* anaphora in (50a–c) with the VP-ellipsis in (50d–e):

- (50) (a) Hillary did so.
 (b) *Did Hillary so?
 (c) Did Hillary do so?
 (d) Hillary did.
 (e) Did Hillary?

Past research has also determined that the *so* of *do so* is syntactically an adverb. As pointed out by Bouton (1970) and Quirk et al. (1985), *inter alia*, the *so* in *do so* contrasts with the pronominals *it* and *that* in *do it* and *do that* anaphora, respectively, in that it does not passivize, as shown in (51a–c).¹³

- (51) (a) *...and so was done by Hillary.
 (b) ...and it was done by Hillary.
 (c) ...and that was done by Hillary.

Furthermore, unlike the other event anaphors, *do so* does not undergo clefting, as illustrated in (52a–d).

- (52) (a) It is that which Hillary did.
 (b) *It is so which Hillary did.
 (c) What Hillary did was that.
 (d) *What Hillary did was so.

Previous accounts have been more equivocal on identifying the type of syntactic relationship that holds between main verb *do* and adverbial *so*. One might be tempted to treat *do* as a transitive verb, on analogy with *do it* and *do that*. However, such an account would quickly run into difficulties. First, *do* would then subcategorize for an adverbial, which would make it almost unique among English verbs with respect to its subcategorization properties.¹⁴ Furthermore, one would have to stipulate that *do* subcategorizes for this one adverb alone; that is, *do* does not

¹³ See Bouton (1970) and Hankamer and Sag (1976) for additional arguments that *so* is adverbial, as opposed to an NP or pro-S.

¹⁴ The only other verb we know of that obligatorily subcategorizes for a manner adverbial is *word*, e.g., *She worded the letter *(carefully)*.

generally permit adverbials in this position, e.g., **do slowly*, **do quietly*.¹⁵ We are thus led toward treating the *do* of *do so* as an intransitive verb, a position for which we present some historical evidence in the next section.¹⁶ Perhaps surprisingly, *do so* does not appear to have much in common with the other forms employing postverbal *so* discussed in Section 3.2. First, *do so* does not pattern with the more manner-oriented meaning of postverbal *so*, as that meaning permits reference to situationally evoked referents. Second, despite possible syntactic similarities with *believe so*, *think so*, and *remain so*, the *so* in *do so* is semantically quite different in that it is not used in the 'affirmative' sense noted for these other verbs.¹⁷

The evidence suggests instead that the semantic properties of *do so* correlate strongly with the preverbal *so* construction in general, and the *so doing* construction in particular. Like *do so*, *so doing* requires that its referent be non-stative, as illustrated by the contrast between (53b) and (53d), indicating that it is the main verb *do* that is operative.

¹⁵ A small number of other highly restricted uses of intransitive *do* with adverbials exist in Modern English. First, expressions such as *do well* or *do poorly*, which are quite distributionally restricted, require some type of competitive or otherwise evaluated event as a referent. For instance, whereas the expression *do well* is acceptable in (i), it is not so in (ii), cf. the form *do it well* in (iii):

- (i) Bill had his debate today. I'm sure he did well.
- (ii) Bill wrote his final project report today. ??I'm sure he did well.
- (iii) Bill wrote his final project report today. I'm sure he did it well.

Note, however, that despite its restricted domain, this construction is nonetheless compositional. Second, one might consider the greeting *How do you do?* as *do* plus the manner adverbial *how*; however, this expression is clearly a fixed (and essentially unanalyzable) idiom and thus not germane to the issue at hand.

¹⁶ Interestingly, although modern American English lacks a fully productive use of intransitive *do*, British English does appear to have such a use after modals and auxiliaries (Quirk et al., 1985):

- (i) Bob says he is going to join the Labour Party. It will be interesting to see whether he does do. (= Quirk et al., 1985, Example 12.22a)

¹⁷ There is a superficially similar construction involving *do* in which *so* is used with this affirmative sense:

- (i) [Context: Sally is teasing Johnny at school]
 Sally: I know you have a crush on Cindy.
 Johnny: Do NOT!
 Sally: Do SO!

In this *do so* construction, intoned with a contrastive pitch accent on *so*, it is the auxiliary – and not main verb – *do* that is operative; thus, it is not the same *do so* construction we have been addressing here.

- (53) (a) Bill signed the legislation and Al did so too.
 (b) Bill signed the legislation and, in so doing, made the Republicans angry.
 (c) #Bill liked the legislation and Al did so too.
 (d) #Bill liked the legislation and, in so doing, made the Republicans angry.

Thus, the *so doing* construction is distinct from the *so did* construction, in which it is auxiliary *do* that is operative, as seen in the contrast between (53d) and (54):

- (54) Bill liked the legislation, and so did Al.

Likewise, one does not find the analog of *so doing* for other auxiliaries (e.g., **so canning*, **so wasing*), whereas one does find the analog of *so did* with other auxiliaries (e.g., *so can*, *so was*).

To summarize to this point, we have presented evidence for treating *do so* as a combination of an intransitive main verb *do* and an adverbial *so*. These properties are shared with the *so doing* construction, suggesting that they are in fact different realizations of the same underlying form. In this observation we find the explanation of the observed anaphoric properties of *do so*.

4.4. An account of *do so*

In Section 3.1, we proposed an account of the information status constraints that preverbal *so* imposes on its referents, specifically that they be discourse-old and salient. While these constraints impose no requirement for parallel syntactic form, the fact that the referents must be discourse-old precludes the possibility of their being situationally evoked.

In this light, *so doing* is simply a special case of the preverbal *so* construction, in which the *doing* can be seen as the most general class of events. Thus, the *so doing* construction is simply a form of hyponymic reference, as is commonly found with NP anaphors.¹⁸ This progression from specific to more general classes is illustrated in (55a–c).

¹⁸ For example:

- (i) John Gotti was arrested today. *The mobster* is accused of killing his former mob boss.

- (55) John Gotti dispensed with his mob boss by shooting him in broad daylight, with plenty of witnesses around.
- (a) By so shooting him, Gotti established himself as his victim's likely successor. [same verb]
 - (b) By so murdering him, Gotti established himself as his victim's likely successor. [more general hyponym]
 - (c) By so doing, Gotti established himself as his victim's likely successor. [most general hyponym]

This analysis accounts for all of the properties of *so doing* and *do so* described thus far. First, these forms specify semantic referents without regard to syntactic parallelism, just as we would expect of any anaphoric expression interpreted with respect to a discourse model. In fact, given the syntactic properties of *do so*, it is not particularly surprising that there is no requirement for syntactically parallel antecedents. Such requirements have been posited for forms of ellipsis (e.g., VP-ellipsis, gapping) in which the syntactic representation of the clause containing the ellipsis is assumed to have an empty node. The need for syntactic parallelism arises either from the fact that a deletion process has applied at this node (Sag, 1976) or from the need to *reconstruct* syntactic material at this node (Williams, 1977; Kitagawa, 1991; Lappin, 1993; Fiengo and May, 1994; Hestvik, 1995). Unlike these forms of ellipsis, however, there is no syntactic evidence that *do so* leaves behind an empty node in the syntax, and thus there is no site for deletion or reconstruction.

Second, the referents of both forms are restricted to non-stative events. This constraint results simply from the fact that stative referents are not 'doings', that is, *doing* is not a more general class of these referents, so hyponymic reference fails. Finally, we have explained why neither form can specify situationally evoked referents, as they are simply special cases of the preverbal *so* construction whose referents must be discourse-old.

The remaining issue is how a postverbal *so* construction like *do so* came to have the anaphoric properties of preverbal *so*. The historical development of *do so* may shed further light on this question. For instance, Higgins (1992) describes the Old English form *swa don*, from which *do so* is derived, in the following way:

...the *swa don* construction was... a construction of a full verb *don* with a deictic-anaphoric manner adverbial *swa*, having a sense something like "to act in such a manner, in that manner". The verb is intransitive and has a very general sense, being used of the acts and activities of agents. The adverb is a manner adverb, modifying the verb in the usual fashion of manner adverbials, the only special property being that it picks up its content from the context. (Higgins, 1992, p. 5)

Higgins' characterization of the properties of *swa don* is consistent with our analysis of *do so* and, as our account would predict, one finds the adverb in *swa don*

realized in preverbal position. It would appear that in the move from *swa don* to *do so*, the form underwent syntactic changes while keeping its anaphoric properties relatively intact.

5. Conclusion

In this paper, we drew upon a large corpus of naturally occurring data to provide an analysis of identifier *so* based on the informational structure of the discourse in which it occurs. It was shown that anaphoric expressions marked with *so* impose a combination of constraints on the information status of their referents that is not found for any NP anaphor in English. Furthermore, different constraints were shown to apply depending on whether the anaphor appears in preverbal or postverbal position.

We then considered the event anaphor *do so* in light of our analysis. In contrast to previous works treating *do so* as a highly idiosyncratic form, we showed that many of its properties are afforded a compositional explanation as predicted by our more general account of *so*. Our account puts to rest the oft-heard claim that *do so* imposes parallelism constraints on the syntactic form of the clause containing the antecedent. Certain idiosyncracies remain, however; in particular we showed that *do so* amalgamates properties of preverbal and postverbal uses of *so*. This might be explained by the properties of the Old English form from which *do so* is derived, in which the adverb was realized in preverbal position.

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CHAPTER 10

At Least Some Determiners Aren't Determiners

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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1. The classical analysis...

One of the success stories in formal semantics is the analysis of NPs as generalized quantifiers, which can be traced back from Barwise and Cooper (1981) via Montague to Frege. The great attraction of this analysis is that it allows for a compositional analysis of the meaning of noun phrases, following independently motivated assumptions about their syntax. For example, Barwise and Cooper analyze NPs like *every boy*, *a boy*, *three boys* and *no boy* as having the syntactic structure [Det *N*], and interpretations as second-order predicates, as follows:

- (1) (a) $\llbracket \text{every boy} \rrbracket = \lambda P \lambda Q [P \subseteq Q](\llbracket \text{boy} \rrbracket), = \lambda Q [\llbracket \text{boy} \rrbracket \subseteq Q]$
- (b) $\llbracket \text{a boy} \rrbracket = \lambda P \lambda Q [P \cap Q \neq \emptyset](\llbracket \text{boy} \rrbracket), = \lambda Q [\llbracket \text{boy} \rrbracket \cap Q \neq \emptyset]$
- (c) $\llbracket \text{three boys} \rrbracket = \lambda P \lambda Q [\#(P \cap Q) \geq 3](\llbracket \text{boy} \rrbracket),$
 $= \lambda Q [\#(\llbracket \text{boy} \rrbracket \cap Q) \geq 3]$
- (d) $\llbracket \text{no boy} \rrbracket = \lambda P \lambda Q [P \cap Q = \emptyset](\llbracket \text{boy} \rrbracket),$
 $= \lambda Q [\llbracket \text{boy} \rrbracket \cap Q = \emptyset]$

These meanings can be combined with the meanings of verbal predicates, like *left*, and we end up with representations like the following:

- (2) (a) $\llbracket \text{every boy left} \rrbracket = \lambda Q [\llbracket \text{boy} \rrbracket \subseteq Q](\llbracket \text{left} \rrbracket), = \llbracket \text{boy} \rrbracket \subseteq \llbracket \text{left} \rrbracket$
- (b) $\llbracket \text{a boy left} \rrbracket = \lambda Q [\llbracket \text{boy} \rrbracket \cap Q \neq \emptyset](\llbracket \text{left} \rrbracket),$
 $= \llbracket \text{boy} \rrbracket \cap \llbracket \text{left} \rrbracket \neq \emptyset$
- (c) $\llbracket \text{three boys left} \rrbracket = \lambda Q [\#(\llbracket \text{boy} \rrbracket \cap Q) \geq 3](\llbracket \text{left} \rrbracket),$
 $= \#(\llbracket \text{boy} \rrbracket \cap \llbracket \text{left} \rrbracket) \geq 3$
- (d) $\llbracket \text{no boy left} \rrbracket = \lambda Q [\llbracket \text{boy} \rrbracket \cap Q = \emptyset](\llbracket \text{left} \rrbracket),$
 $= \llbracket \text{boy} \rrbracket \cap \llbracket \text{left} \rrbracket = \emptyset$

Determiners are analyzed here as relations between a nominal predicate meaning and a verbal predicate meaning (e.g., $\llbracket \text{every} \rrbracket = \lambda P \lambda Q [P \subseteq Q]$).

This representation format has allowed researchers like Barwise and Cooper, van Benthem, Keenan and others to arrive at interesting and deep characterizations of the semantic nature of the determiners in natural language, such as conservativity, and of important subclasses, such as intersective and proportional determiners (cf. overviews like Westerståhl (1989) and Keenan and Westerståhl (1997)).

However, in spite of these impressive successes, the evidence is growing that the determiners of natural languages are not, or at least not all, relations between predicate meanings. Jacobs (1980) has argued that negative determiners, like German *kein* 'no', should be analyzed as an indefinite with a negation that may have wider scope. In the analyses offered by the various versions of dynamic interpretation starting with Kamp (1981) and Heim (1982), a distinction is made between

indefinite NPs like *a boy* and truly quantified NPs like *every boy*; only the second type was analyzed as a generalized quantifier. In the theories that tried to account for the singular/plural distinction and the collective and cumulative readings, such as Verkuyl (1981) and Link (1987), it was argued that number words like *three* should not be analyzed as determiners, but rather as adjectives. The GQ analysis also turned out problematic for certain types of NPs, such as predicative NPs. Par-tee (1987) proposed a system of type-shifts that would relate the various emerging interpretations of NPs to each other.

In this article I will discuss another class of NPs for which there is evidence that the GQ analysis is on the wrong track. These are NPs like *more than three boys*, *at most three boys*, *exactly three boys* and *between three and five boys*. The GQ analysis ascribes to the determiners of those NPs the following interpretations:

- (3) (a) $[[\textit{more than three}]] = \lambda P \lambda Q [\#(P \cap Q) > 3]$
- (b) $[[\textit{at least three}]] = \lambda P \lambda Q [\#(P \cap Q) \geq 3]$
- (c) $[[\textit{at most three}]] = \lambda P \lambda Q [\#(P \cap Q) \leq 3]$
- (d) $[[\textit{exactly three}]] = \lambda P \lambda Q [\#(P \cap Q) = 3]$
- (e) $[[\textit{between three and five}]] = \lambda P \lambda Q [3 \leq \#(P \cap Q) \leq 5]$

Obviously, this gives us the right truth conditions for sentences like *at most three boys left*; they say that the cardinality of the set that contains the weeping boys is smaller or equal than three:

- (4) $[[\textit{at most three boys left}]] = [\#([[\textit{left}]] \cap [[\textit{boys}]]) \leq 3]$

However, once we consider a wider range of phenomena, problems appear with this type of representation.

2. ... and its problems

2.1. *Three and at least three*

One problem of the classical analysis is that it cannot explain the semantic difference between a simple number word, like *three*, and the more complex determiner *at least three*. Barwise and Cooper (1981) analyze *three* as in (1c), which allows for more than three elements in the intersection. This is justified by the fact that sentences like *Three boys left* are compatible with sentences that say that the number of boys that left was higher:

- (5) Three boys left, perhaps even four.

The fact that a sentence like *three boys left* typically is understood as saying that no more than three boys left can be explained as a scalar implicature generated

by the maxim of Quantity (Grice (1975)); it is actually a prime example for that type of implicature (cf. Horn (1972), Levinson (1983)). Speakers operate under the maxim of being as informative as possible (a maxim that is checked by other maxims, such as being concise). If the speaker had known that the number of boys that left was three, the speaker would have uttered the sentence *three boys left*; as the speaker did not do so, the hearer can safely assume that the speaker lacks evidence for this latter sentence, or even knows that it is false.

But classical GQ theory gives the same interpretation to *at least three boys*, cf. (3b). This is semantically motivated, because the bare truth conditions seem to be the same in both cases: both *three boys left* and *at least three boys left* allow for the possibility that more than three boys left, and exclude the possibility that the number of boys that left was smaller than three. However, notice that *at least three boys* does not trigger the scalar implicature that we have observed with *three boys*. The sentence *at least three boys left* is not understood as implicating that not more than three boys left. This is what is behind the following contrast:

- (6) (a) A: Three boys left.
 B: No, four.
 (b) A: At least three boys left.
 B: *No, four.

Also, we cannot really imply the usual locutions that would cancel an implicature:

- (7) ?? At least three boys left, perhaps even four.

We might try to explain this rather striking difference as follows. It is well known that scalar implicatures do not arise with just any terms. For example, we know that the term *apple* is a hyponym of *fruit*, and that whenever someone ate an apple, then he ate a fruit, but not vice versa. But a sentence like

- (8) Peter ate a fruit.

certainly does not implicate that Peter didn't eat an apple, or even that the speaker doesn't know whether or not Peter ate an apple. Notice that we could apply usual quantity reasoning to this case: In uttering (8) Speaker has avoided to use the (equally short and simple) expression *Peter ate an apple*, hence it follows that this expression is false.

The answer to this problem is that not every two expressions α, β such that $[\dots\alpha\dots]$ has a stronger meaning than $[\dots\beta\dots]$ are such that the utterance of $[\dots\beta\dots]$ will generate the scalar implicature $\neg[\dots\alpha\dots]$. For scalar implicatures to arise, α and β have to be, in addition, elements of a so-called Horn scale. Now, the number words *three* and *four* are elements of a Horn scale, but the nouns *fruit* and *apple* are not. This should presumably be part of the lexical knowledge of speaker and hearer.

But this turn does not get us anywhere: If number words form Horn scales, then they should do so in any context in which they appear. In particular, they should do so not only when they occur as determiners, as in *three boys*, but also when they occur as noun modifiers (or perhaps as parts of determiners), as in *at least three boys*. But then we predict that a sentence like *at least three boys left* has to be compared with semantically stronger sentences, like *at least four boys left*, and the fact that the speaker did not use these sentences leads to the implicature that they are false. We get exactly the same implicature as with *three boys left*.

2.2. Cumulative interpretations

The next problem concerns the representation of quantificational determiners with number words in general, be it *three*, *at least three*, *at most three* or *exactly three*. It is well known that they do not give us the right analysis for a prominent reading of sentences in which more than one such NP occurs, namely, the cumulative reading (cf. Scha (1981)):

- (9) (a) Three boys ate seven apples.
 (b) At least three boys ate at least seven apples.
 (c) At least three boys ate at most seven apples.
 (d) Exactly three boys ate exactly seven apples.

Under the cumulative interpretation, (9a) means 'three boys ate apples and seven apples were eaten by boys'. The sentence does not tell us anything about how the apples distribute over the boys.¹ It is impossible to generate this reading using the GQ interpretation of the NPs in a principled way from the surface structure of this sentence, or from a logical form of the type that is normally assumed. The reason is that in the GQ interpretation, each NP has scope, and one NP must take scope over the other. We get the following possible interpretation, under the assumption that NPs undergo LF-movement (alternatively, we can give an in-situ interpretation that works with type shifting).

- (10) *three boys*₁[*seven apples*₂[*t*₁ ate *t*₂]]
 $\lambda P[\#([\textit{boy}]] \cap P) \geq 3]$
 $((x \mid [\lambda P[\#([\textit{apple}]] \cap P) \geq 7])(y \mid [[[\textit{ate}]](y)(x)]))]$
 $= \#([\textit{boy}] \cap \{x \mid \#([\textit{apple}] \cap \{y \mid [[[\textit{ate}]](y)(x)]\}) \geq 7\}) \geq 3]$

This says that three boys ate seven apples each. The other possible derivation is one in which the object outscopes the subject, which amounts to saying that seven

¹ In case the two numbers are the same, an interpretation that involves a one-to-one mappings is strongly preferred, as in *three boys ate three apples*. But I think this is not a separate reading of such sentences. Rather, it indicates a preferred cognitive model for how such sentences are understood. The reason of this preference certainly is the cognitive simplicity of one-to-one mappings.

apples were eaten by three boys each. This reading is not only implausible for practical reasons, but also highly unlikely, arguably impossible, for linguistic reasons.

The paraphrase that I have used above rather suggests the following interpretation:

$$(11) \quad \#([\textit{boy}] \cap \{x \mid \exists y([\textit{apple}](y) \wedge [\textit{ate}](x, y))\}) \geq 3 \wedge \\ \#([\textit{apple}] \cap \{y \mid \exists x([\textit{boy}](x) \wedge [\textit{ate}](x, y))\}) \geq 7$$

The problem is, as stated above, that it is unclear how the representation (11) can be developed from (9a) in a principled, compositional way.

Incidentally, in Scha's original treatment of cumulative readings, the assigned representation is not quite the one in (11), but one in which the greater-or-equal signs are replaced by equal signs. However, this should not be part of the truth conditions proper, but be derived as a scalar implicature. Notice that this additional meaning component can be canceled, which is characteristic for implicatures. This is particularly clear with the object NP (cf. (12a)), but considerably less so with the subject (cf. (12b)).

- (12) (a) Three boys ate seven apples, perhaps even eight apples.
(b) ?Three boys, perhaps even four boys, ate seven apples.

In any case, under Scha's original representation it remains unclear how (9a) differs from (9d), which presumably expresses Scha's representation.

We find cumulative readings with other NPs as well, for example, with *at least three boys* (cf. (9b)). Examples like (9c) with "mixed" directions are of particular interest. Such cases occur in particular in sentences that describe statistical distributions:

- (13) In Guatemala, (at most) three percent of the population owns (at least) seventy percent of the land.

Interestingly, the parts *at most* and *at least* are not even necessary here to get the intended interpretation. This clearly is a problem if we analyze, for example, *three percent* as *at least three percent*, as GQ theory wants to have it.

The problem cases discussed here clearly require a representation in which NPs are not scoped with respect to each other. Rather, they ask for an interpretation strategy in which all the NPs in a sentence are somehow interpreted on a par.

2.3. Accent and syntactic distribution

A further problem of the GQ account of determiners like *at least* and *less than* is that their semantic contribution in sentences is influenced by accent in a way that other quantifiers, like *every*, *most* and *each*, are not. In the following example, the position of the main accent is indicated by acute accent on the stressed syllable.

- (14) (a) At least *thréé* boys left.
 (b) At least three *bóys* left.

(14a) means: 'The number of boys that left is at least three'; it allows for there being a number n greater than three such that ' n boys left' is true. Clearly, accent identifies the number word here. The accent in (14b) can either identify the head noun, or the construction consisting of number word and noun (a case of focus projection). Let us concentrate here on the second case. Then (14b) says: 'The persons that left include three boys'; it allows for there being other persons x such that ' x left' is true as well. This difference leads to testable consequences when we look at the contexts in which (14a) and (14b) can be uttered. (14a) but not (14b) is fine as an answer to a question, *how many boys left?* And (14b) but not (14a) is fine as an answer to a question, *who (all) left?*

Such accent differences do not lead to comparable semantic differences with other quantifiers. Among the determiners that allow for number words are *all* and *the*. We do not find a similar difference in interpretation with the following examples:

- (15) (a) All *thréé* boys left.
 (b) All three *bóys* left.

Furthermore, expressions like *at least*, *at most*, *less than*, *more than* and *exactly* differ in their syntactic distribution from bona fide determiners like *every* or *most*. For example, they can form constituents with NPs, adjectives, and VPs, or Det's, as the following examples show:

- (16) (a) John saw at least Mary.
 (b) The aggressors wanted more than the southern province.
- (17) (a) Mary was at least satisfied.
 (b) We are more than happy to serve you.
- (18) (a) The guest at least left early.
 (b) He at most spanked the child.
- (19) (a) At least some determiners aren't determiners.
 (b) At most eight percent of the students won't get a job.

Differences in syntactic distributions are normally cited to justify the exclusion of *only* from the set of natural-language quantifiers. This comes quite handy because an expression like *only boys*, analyzed as quantifiers, fails to show conservativity, which is typically seen as the most important general property of natural language determiners. But then expressions like *at least* or *more than* should not be analyzed as quantifiers either. Evidently, the usual GQ interpretation of expressions like *at least three boys* should be rather the result of the general meaning of *at least*, which can be combined with a wider variety of constituents, and *three boys*.

3. A new analysis

In this section I will propose solutions to the various problems that we have encountered with the GQ analysis of expressions like *at least three boys*. I will start, however, with an analysis of NPs with simple number words like *three boys* in sentences with cumulative interpretations.

3.1. Number words in cumulative interpretations

We have seen in Section 2.2 that the GQ analysis of NPs like *three boys* is problematic for cumulative interpretations. In particular, this analysis forces us to assume that NPs are scoped, but the hallmark of cumulative interpretations is that the NPs of a sentence do not take scope over each other.

Cumulative interpretations need not be stipulated as a separate interpretation scheme as in Scha (1981); they can be derived in a more systematic and independently justified way. I have discussed this in Krifka (1989) and more specifically in Krifka (1992b); cf. also Landman (1995, to appear).

First, we have to assume a general rule for the interpretation of verbal predicates, which I have called **cumulativity**. With intransitive predicates α , cumulativity amounts to the following: If α applies to two individuals x and x' , then α also applies to the sum individual consisting of x and x' , for which I write $x \oplus x'$. For example, if the predicate *run* applies to Mary and to John, then it also applies to the sum consisting of Mary and John. This reflects the fact that the truth of the sentences *Mary runs* and *John runs* allows us to infer the truth of the sentence *Mary and John run*.

Transitive predicates behave the same. If the transitive predicate β applies to the individuals x and y , and also to the individuals x' and y' , then it applies to the sum individuals $x \oplus x'$ and $y \oplus y'$ as well. For example, if Mary read 'Ulysses' and John read 'Moby Dick', then the sentence

(20) Mary and John read 'Ulysses' and 'Moby Dick'

is true as well. Of course, (20) has other readings as well, in particular the distributive reading in which both Mary and John are said to have read 'Ulysses' and 'Moby Dick'. But this reading arguably requires an additional operator for distributivity that can be made explicit by *each*, as in *John and Mary each read 'Ulysses' and 'Moby Dick'*. Furthermore, (20) in its cumulative reading may be interpreted more specifically as excluding that Mary read 'Moby Dick' and John read 'Ulysses', an interpretation can be enforced by adding *respectively*. We may either account for this by an additional pragmatic principle (perhaps derived from Grice's manner maxim: 'be orderly'), or by assuming a sum formation that is order sensitive. Cumulativity based on order-sensitive sum formation would allow us to derive from $\beta(x, y)$ and $\beta(x', y')$ that $\beta(x \oplus x', y \oplus y')$, which is not equivalent

to, say, $\beta(x \oplus x', y' \oplus y)$. However, for the rest of this paper I will disregard the issue how this more specific interpretation comes about, and I will assume that sum formation is commutative, that is, not order sensitive. The motivation for that is that we can continue (20) with *More specifically, Mary read 'Moby Dick' and John read 'Ulysses'*, without contradiction.

Cumulativity can be generalized to n -place relations, in the following way:

(21) An n -place predicate R is cumulative iff the following holds:

If $R(x_1, \dots, x_n)$ and $R(x'_1, \dots, x'_n)$, then $R(x_1 \oplus x'_1, \dots, x_n \oplus x'_n)$.

Cumulativity allows us in particular to allow for inference patterns like the following. Assume that b_1, b_2, b_3 are boys and $a_1 \dots a_7$ are apples.

(22) b_1 ate a_1 and a_2, b_2 ate a_3, a_4 and a_5 , and b_3 ate a_6 and a_7 , then
 $b_1 \oplus b_2 \oplus b_3$ ate $a_1 \oplus a_2 \oplus a_3 \oplus a_4 \oplus a_5 \oplus a_6 \oplus a_7$.

It is natural to analyze an expression like *three boys* as a nominal predicate that applies to sum individuals that fall under the predicate *boys* and consist of three atoms. Then the second line of (22) entails the following:

(23) $\exists x[[\text{three boys}]](x) \wedge \exists y[[\text{seven apples}]](y) \wedge [[\text{eat}]](x, y)]$

In general, we have that whenever the sentence schemes n boys ate m apples and n' boys ate m' apples are true, then the sentence schema $n + n'$ boys ate $m + m'$ apples is true. The reason for this is that *ate* is cumulative and that one and the same apple cannot be eaten twice. (Notice that this is a crucial condition that is not satisfied for, for example, the predicate *touch*.)

I would now like to suggest that (23) is a representation of the sentence (9a), repeated here.

(24) Three boys ate seven apples.

First of all, notice that (23), in contrast to (11), can be derived in a straightforward way from (24). We have to work under the assumption that an NP like *three boys* is analyzed as $[_{NP} \emptyset_{DET} [_{N} \text{three boys}]]$, with an empty determiner position that is interpreted as an existential quantifier, and an analysis of *three* as a modifier that restricts the denotation of *boys* to those sum individuals that consist of three atoms. This is the representation suggested in Link (1987):

(25) (a) LF: $\text{three boys}_1 [\text{seven apples}_1 [t_1 \text{ ate } t_2]]$

(b) $\lambda P \exists x [[\text{three boys}]](x) \wedge P(x) (\lambda x [\lambda P \exists x [[\text{seven apples}]](x) \wedge P(x)] (\lambda y [[\text{ate}]](x, y))) = (23)$

Alternatively, we can follow the analysis of indefinites in Heim (1982) and assume that the existential quantifier is introduced by global existential closure.

Notice that in the representation (23), the two NPs do not take scope with respect to each other, insofar as formulas of the form $\exists x[\Phi[x] \wedge \exists y[\Psi[x, y]]]$ are equivalent to formulas of the form $\exists x, y[\Phi[x] \wedge \Psi[x, y]]$, if y does not occur free in Φ . This is one important requirement for cumulative readings. Furthermore, notice that we get the same interpretation as with (11), under the assumption that $[[eat]]$ is cumulative. The formula (23) is not only true for the situation described in (22), but for any situation in which the number of boys that ate apples is at least three, and the number of apples eaten by boys is at least seven.

How does the additional information arise that we get from (24) and that is captured in Scha's original rendering of such sentences, namely, that the number of boys that ate apples is exactly three, and the number of apples eaten by boys is exactly seven? As suggested in Section 2.2, we get this is by scalar implicature. A speaker that utters (24) selects that sentence out of a competing set of other sentences, given schematically below:

(26)

$$\left\{ \begin{array}{c} \dots \\ \text{four} \\ \text{three} \\ \text{two} \\ \dots \end{array} \right\} \text{ boys ate } \left\{ \begin{array}{c} \dots \\ \text{eight} \\ \text{seven} \\ \text{six} \\ \dots \end{array} \right\} \text{ apples}$$

Grice's maxim of Quantity, more specifically its first submaxim, 'be as informative as required by the purpose of the information exchange', will force the speaker to choose the highest numbers n , m such that the sentence n boys ate m apples is true. This is because the sentence n boys ate m apples will entail sentences like n' boys ate m' apples, for certain n' smaller than n and m' smaller than m , but will not be entailed by them.² This will certainly not be the case for all such alternative number words n' , m' . For example, the model in (22) does not support that two boys ate six apples. This is different from other known cases of scalar implicature, for which it is often assumed that, if a sentence $\Phi[\alpha]$ that contains α is true, were α is an element of a Horn scale, and β is any expression that is lower on the Horn scale, then $\Phi[\beta]$ will be true as well.³ For example, the sentence *John ate seven apples* entails that *John ate six apples*, *John ate five apples*, and so on. However, if the main interest is in the number of boys that ate apples, and the number of apples eaten by boys, which is a very typical background for such sentences, then the maxim of Quantity will lead us to assume the greatest such numbers that still yield a true proposition.

² One exception are collective sentences. Assume that Mary and Sue jointly own a horse, then the sentence *Two girls own a horse* is true, but the sentence *one girl owns a horse* isn't. This shows that the collective interpretation should be taken as a separate reading of a sentence that is not dependent on alternatives in the same sense as the cumulative interpretation.

³ With the exception of hierarchical scales. For example, the sentence *Mary is a full professor* does not entail that Mary is an associate professor. I will come back to such scales.

That we need a special type of background for the understanding of such sentences becomes obvious when we consider sentences in cumulative interpretations that express statistical correlations, as in (13), repeated here.

- (27) In Guatemala, three percent of the population own seventy percent of the land.

It is clear that the maximization strategy discussed for (24) does not work in this case. Under the simplifying (and wrong) assumptions that foreigners do not own land in Guatemala and all the land of Guatemala is owned by someone, this strategy would lead us to select the alternative *In Guatemala, 100 percent of the population own 100 percent of the land*, which clearly is not the most informative one among the alternatives – as a matter of fact, it is pretty uninformative. We cannot blame this on the fact that the NPs in (27) refer to percentages, as we could equally well express a similar statistical generalization with the following sentence (assume that Guatemala has 10 million inhabitants and has an area of 100,000 square kilometers):

- (28) In Guatemala, 300,000 inhabitants own 70,000 square kilometers of land.

Again, the alternative *In Guatemala, 10 million inhabitants own 100,000 square kilometers of land* would be uninformative, under the background assumptions given.

What is peculiar with these sentences is that they want to give information about the bias of a statistical distribution. One conventionalized way of expressing particularly biased distributions is to select a small set among one dimension that is related to a large set of the other dimension. Obviously, to characterize the distribution correctly, one should try to decrease the first set, and increase the second. In terms of informativity of propositions, if (27) is true, then there will be alternative true sentences of the form *In Guatemala, n percent of the population own m percent of the land*, where *n* is greater than *three*, and *m* is smaller than *seventy*. But these alternatives will not entail (27), and they will give a less accurate picture of the skewing of the land distribution.

3.2. The generation and use of alternatives

One important point for our purposes that should be addressed explicitly is that scalar implicature cannot be applied locally in cases like (24), but has to be applied globally, across the board. It has to affect the two positions that introduce alternation simultaneously, as illustrated in (26). Which type of grammatical process would provide us with the necessary information to express this type of access to variation?

One way is to assume the mechanism of Alternative Semantics that Rooth (1985) has suggested for the description of focus-sensitive operators, like *only* and *even*. In this theory, expressions that are in focus have the semantic function of introducing alternatives. These alternatives are then projected in a systematic way, till they meet an operator that uses them. As I said, Rooth considered alternatives introduced by focus, which are marked by accent. While we find that accent on the number words is quite natural in cases like (24) and (27), it does not seem to be required to get the indicated cumulative interpretations. So we might assume that certain types of expressions, like number words, can introduce alternatives without the help of focus. Also, their alternatives are of a particular type; the number adjective *three* does not introduce a color adjective like *green* as an alternative, but other number adjectives. This property of introducing alternatives without the help of focus is characteristic for the expressions that have been considered as being part of a Horn scale.⁴

Rooth (1985) proposed a general and simple mechanism under which alternatives are projected. Assume that the standard semantic interpretation for a complex expression $[\alpha \beta]$ is given compositionally as a function f of the meaning of the immediate parts α and β . Then the set of alternatives of the interpretation of $[\alpha \beta]$ is the set of meanings that can be obtained by applying the function f to the alternatives of the meaning of α and of β . Let us refer to the alternatives of the meaning of α with $[[\alpha]]_A$, then we have the following general rule:

- (29) If $[[[\alpha \beta]]] = f([[\alpha]], [[\beta]])$,
 then $[[[\alpha \beta]]]_A = \{f(X, Y) \mid X \in [[\alpha]]_A, Y \in [[\beta]]_A\}$

Expressions that do not have proper alternatives are assumed to have the singleton set containing their meaning as alternatives. The scheme in (29) allows for the simultaneous introduction of proper alternatives from α and β , which results in the type of variation illustrated in (26). To see this, consider the derivation of the alternatives of (24), along the lines of (25). Here, I render number words by numbers, where, e.g., $7(x)$ says that x is a sum individual consisting of seven atoms. It can be seen as an abbreviation of $\lambda x[\#(x) = 7]$, where $\#(x)$ gives the number of atoms that the sum individual x consists of. N is the set of all number words.

- (30) (a) $[[seven]] = \lambda P \lambda x[7(x) \wedge P(x)]$
 $[[seven]]_A = \{\lambda P \lambda x[n(x) \wedge P(x)] \mid n \in N\}$
 (b) $[[apples]] = \text{APPLES}$
 $[[apples]]_A = \{\text{APPLES}\}$
 (c) $[[seven \text{ apples}]] = \lambda P \lambda x[7(x) \wedge P(x)](\text{APPLES}),$
 $= \lambda x[7(x) \wedge \text{APPLES}(x)]$

⁴ In Krifka (1995) I argue that negative polarity items, like *ever* or *lift a finger*, have this property as well.

$$\begin{aligned} \llbracket \text{seven apples} \rrbracket_A &= \{X(Y) \mid X \in \llbracket \text{seven} \rrbracket_A, Y \in \llbracket \text{apples} \rrbracket_A\} \\ &= \{\lambda x[n(x) \wedge \text{APPLE}(x)] \mid n \in N\} \end{aligned}$$

$$(d) \quad \llbracket \emptyset_{\text{DET}} \rrbracket = \lambda Q \lambda P \exists x[Q(x) \wedge P(x)]$$

$$\llbracket \emptyset_{\text{DET}} \rrbracket_A = \{\lambda Q \lambda P \exists x[Q(x) \wedge P(x)]\}$$

$$(e) \quad \llbracket [\text{NP} \emptyset [\text{seven apples}]] \rrbracket$$

$$= \lambda Q \lambda P \exists x[Q(x) \wedge P(x)](\lambda x[7(x) \wedge \text{APPLES}(x)])$$

$$= \lambda P \exists x[7(x) \wedge \text{APPLES}(x) \wedge P(x)]$$

$$\llbracket [\text{NP} \emptyset [\text{seven apples}]] \rrbracket_A$$

$$= \{X(Y) \mid X \in \llbracket \emptyset_{\text{DET}} \rrbracket_A, Y \in \llbracket \text{seven apples} \rrbracket_A\}$$

$$= \{\lambda P \exists x[n(x) \wedge \text{APPLE}(x) \wedge P(x)] \mid n \in N\}$$

$$(f) \quad \llbracket [t_1 \text{ ate } t_2] \rrbracket = \text{ATE}(x_1, x_2)$$

$$\llbracket [t_1 \text{ ate } t_2] \rrbracket_A = \{\text{ATE}(x_1, x_2)\}$$

$$(g) \quad \llbracket [[\text{NP} \emptyset [\text{seven apples}]]_2 [t_1 \text{ ate } t_2]] \rrbracket$$

$$= \lambda P \exists x[7(x) \wedge \text{APPLES}(x) \wedge P(x)](\lambda x_2[\text{ATE}(x_1, x_2)])$$

$$= \exists x[7(x) \wedge \text{APPLES}(x) \wedge \text{ATE}(x_1, x)]$$

$$\llbracket [[\text{NP} \emptyset [\text{seven apples}]]_2 [t_1 \text{ ate } t_2]] \rrbracket_A$$

$$= \{X(\lambda x_2[Y]) \mid X \in \llbracket [\text{NP} \emptyset_{\text{DET}} [\text{seven apples}]] \rrbracket_A,$$

$$Y \in \llbracket [t_1 \text{ ate } t_2] \rrbracket\}$$

$$= \{\exists x[n(x) \wedge \text{APPLES}(x) \wedge \text{ATE}(x_1, x)] \mid n \in N\}$$

$$(h) \quad \llbracket [\text{NP} \emptyset [\text{three boys}]] \rrbracket = \lambda P \exists x[3(x) \text{ BOYS}(x) \wedge P(x)]$$

$$\llbracket [\text{NP} \emptyset [\text{three boys}]] \rrbracket_A = \{\lambda P \exists x[n(x) \text{ BOYS}(x) \wedge P(x)] \mid n \in N\}$$

$$(i) \quad \llbracket [[\text{NP} \emptyset [\text{three boys}]]_1 [[\text{NP} \emptyset [\text{seven apples}]]_2 [t_1 \text{ ate } t_2]] \rrbracket$$

$$= \lambda P \exists x[3(x) \text{ BOYS}(x) \wedge P(x)](\lambda x_1 \exists x[7(x) \wedge \text{APPLES}(x) \wedge \text{ATE}(x_1, x)])$$

$$= \exists y \exists x[3(y) \wedge \text{BOYS}(y) \wedge 4(x) \wedge \text{APPLES}(x) \wedge \text{ATE}(y, x)]$$

$$\llbracket [[\text{NP} \emptyset [\text{three boys}]]_1 [[\text{NP} \emptyset [\text{seven apples}]]_2 [t_1 \text{ ate } t_2]] \rrbracket_A$$

$$= \{X(\lambda x_1[Y]) \mid X \in \llbracket [\text{NP} \emptyset [\text{three boys}]] \rrbracket_A,$$

$$Y \in \llbracket [[\text{NP} \emptyset [\text{seven apples}]]_2 [t_1 \text{ ate } t_2]] \rrbracket_A\}$$

$$= \{\exists y \exists x[n(y) \wedge \text{BOYS}(y) \wedge m(x) \wedge \text{APPLES}(x) \wedge \text{ATE}(y, x)] \mid n, m \in N\}$$

We see that the variations introduced by *seven* and *three* end up on equal footing in the set of alternatives. This was intended in Rooth's original application of this idea, which included the treatment of sentences with complex foci, as in *John only introduced Bill to Sue*, with the meaning 'the only pair $\langle x, y \rangle$ such that John introduced x to y is $\langle \text{Bill}, \text{Sue} \rangle$ '.

The derivation (30) led to the following pair of a regular meaning and a set of alternatives:

- (31) (a) Meaning: $\exists x \exists y [3(x) \wedge \text{BOYS}(x) \wedge 7(y) \wedge \text{APPLES}(y) \wedge \text{ATE}(x, y)]$
 (b) Alternatives: $\{\exists x \exists y [n(x) \wedge \text{BOYS}(x) \wedge m(y) \wedge \text{APPLES}(y) \wedge \text{ATE}(x, y)] \mid n, m \in N\}$

The meaning expresses the proposition 'three boys ate seven apples', and the set of alternatives consist of propositions of the form ' n boys ate m apples', where n, m are numbers. I should say that I simplified things a bit for the sake of exposition, as I did not indicate in the semantic representations the possible world parameter. Actually, every semantic representation given here should be a function from possible worlds. For example, the meaning is not quite the one given in (31a), but rather $\lambda w \exists x \exists y [3(x) \wedge \text{BOYS}(w)(x) \wedge 7(y) \wedge \text{APPLES}(w)(y) \wedge \text{ATE}(w)(x, y)]$, a function from worlds w to truth if, in w , three boys ate seven apples.

The formation of the scalar implicature discussed in Section 3.1 has to relate this meaning and this set of alternatives in some way. It is plausible to locate the origin of scalar implicature in a pragmatic operator assert that expresses that a sentence is asserted.⁵ The function of this operator can be expressed in the following way (cf. also Krifka (1992a)):

- (32) ASSERT(M, A, c) (a sentence with meaning M and alternatives A in a context c is asserted):
 – the speaker claims M (in c);
 – for every alternative $M' \in A$, $M' \neq M$, the speaker explicitly does not claim M' (in c).

There must be a pragmatic reason why the speaker introduces alternative propositions without actually claiming them, reasons that are obvious to the hearer. There are, essentially, two types of reasons for the cases that are relevant here:

- It may be that M' is more informative than M (in c). The reason in this case is obviously that the speaker lacks evidence for M' , and perhaps even has evidence that M' is false. That is, uttering M' instead would violate the maxim of Quality.
- It may be that M' is less informative than M (in c). The reason in this case is obviously that the speaker prefers M because it gives more information, in c . That is, uttering M' instead would violate the maxim of Quantity.

⁵ Other illocutionary operators, like interrogative or imperative, will lead to similar scalar implicatures. The proposal that illocutionary operators may be sensitive to the alternatives of a sentence goes back to Jacobs (1984), where it is stated for alternatives that are introduced by focus.

It is important to have the utterance context, c , as a parameter in these formulations. This is because we have seen with the contrast of examples like (24) and (27) (the Guatemala example) that what counts as more or less informative might depend on the context.

3.3. At least *quantifiers*

Let us now discuss expressions like *at least*, *at most* or *exactly* that we have identified as being subject to accentual influences in Section 2.3. In this section I will outline the basics of the theory I am proposing with the example *at least*. In the next sections I will extend the treatment to other quantifiers, which will necessitate an important change in the theory that we will develop here for *at least*.

We may try to analyze expressions like *at least three* in a way that is inspired by our treatment of simple number words in the preceding section. That is, we may analyze *at least three* as an adjective that applies to sum individuals which consist of at least three atoms, and *at most three* as an adjective that applies to sum individuals that consist of at most three atoms. But this analysis would not solve the problems discussed in Section 2, and introduce problems of its own. First, it would predict, together with the assumptions we have made in Section 3.2, that scalar implicature is invoked by a sentence like (33a). It contains the number words *three* and *seven*, which by assumption introduce alternatives regardless in which syntactic position they occur.

- (33) (a) At least three boys ate at least seven apples.
 (b) Meaning: $\exists x, y [\geq 3(x) \wedge \text{BOYS}(x) \wedge \geq 7(y) \wedge \text{APPLES}(y) \wedge \text{EAT}(x, y)]$
 (c) Alternatives: $\{\exists x, y [\geq n(x) \wedge \text{BOYS}(x) \wedge \geq m(y) \wedge \text{APPLES}(y) \wedge \text{EAT}(x, y)] \mid n, m \in N\}$

I have used the notation “ ≥ 3 ” as an abbreviation for $\lambda x [\#(x) \geq 3]$. The problem with (33) is that, if we apply scalar implicature as specified for the operator ASSERT, we will end up with exactly the same meaning as for (24). By scalar implicature, any utterance of (33a) will exclude propositions of the form *at least n boys ate at least m apples*, for n greater than *three* and m greater than *seven*, which amounts to saying that the number of boys that ate apples was three, and the number of apples eaten by boys was seven.

A further problem for the application of ideas developed in Section 3.2 is that the particle *at least* need not be related to a set of alternatives that are ordered by semantic strength. Example:

- (34) Mary is at least an associate professor (perhaps even a full professor).

In the first clause of (34), the alternatives ('Mary is an assistant professor', 'Mary is an associate professor', 'Mary is a full professor', etc.) are not ordered with respect to semantic strength. Neither is the set of associate professors a subset of the set of full professors or vice versa. We must assume that particles like *at least* presuppose that the alternatives are ranked in some way which sometimes is related to semantic strength (as in *Mary ate at least three apples*), but often not, as in (34).

I will represent ranked alternatives here as partial ordering relation \leq , from which we can derive the set of alternatives as the field of \leq , defined as follows:

$$(35) \quad \text{Field}(\leq) = \{x \mid \exists y[x \leq y \vee y \leq x]\}$$

Expressions like number words, terms denoting ranks in a social hierarchy, and many other expressions come with such an ordering relation. One important ordering relation is induced by the part relation of sum individuals, \leq_i , which tells us, for example, that John is a part of the sum individual consisting of John and Mary, and this is a part of the sum individual consisting of John, Mary and Sue. This ordering relation is responsible for the use of *at least* in sentences like the following:

$$(36) \quad \text{At least John and Mary left (perhaps also Sue, i.e., perhaps even John, Mary and Sue).}$$

In the previous section, Example (30), we have seen how alternatives are projected in semantic compositions. If the alternatives are ordered, the ordering should be projected in a similar way. This can be done with the following projection rule, which expands on (29) and says that the resulting ordering relation is a combination of the ordering relations of the parts.

$$(37) \quad \begin{array}{l} \text{If } \llbracket [\alpha \beta] \rrbracket = f(\llbracket \alpha \rrbracket, \llbracket \beta \rrbracket), \\ \text{then } \llbracket [\alpha \beta] \rrbracket_A = \{ \langle f(X, Y), f(X', Y') \rangle \mid \langle X, X' \rangle \in \llbracket \alpha \rrbracket_A \text{ and } \langle Y, Y' \rangle \in \llbracket \beta \rrbracket_A \} \end{array}$$

Let me discuss the theory proposed here with a simple example:

$$(38) \quad \text{At least } \text{thréé}_F \text{ boys left.}$$

Accent on *three* indicates focus on the number word, here indicated by a subscript F. Numbers are not just related to an alternative set (N), but to an order relation \leq_N , here, the order relation for numbers.

$$(39) \quad \begin{array}{l} (a) \quad \llbracket \text{thréé}_F \rrbracket = \lambda P \lambda x [3(x) \wedge P(x)] \\ \quad \llbracket \text{thréé}_F \rrbracket_A \\ \quad = \{ \langle \lambda P \lambda x [n(x) \wedge P(x)], \lambda P \lambda x [m(x) \wedge P(x)] \rangle \mid n \leq_N m \} \end{array}$$

Expressions that are not related to any ordering relation and that are not in focus do not introduce proper alternatives. We can assume that they come with a set consisting of their meaning proper (for unordered alternatives), and a pair formed with their meaning proper (for ordered alternatives). I will call such alternatives **standard alternatives**, for short.

- (40) (b) $\llbracket \text{boys} \rrbracket = \text{BOYS}$
 $\llbracket \text{boys} \rrbracket_A = \{\text{BOYS}, \langle \text{BOYS}, \text{BOYS} \rangle\}$ (the standard alternatives)
 (c) $\llbracket \text{thréé}_F \text{ boys} \rrbracket = \lambda x [3(x) \wedge \text{BOYS}(x)]$
 $\llbracket \text{thréé}_F \text{ boys} \rrbracket_A$
 $= \{ \langle \lambda x [n(x) \wedge \text{BOYS}(x)], \lambda x [m(x) \wedge \text{BOYS}(x)] \rangle \mid n \leq_N m \}$

Let us assume that the particle *at least* can be applied at this level, on nominal predicates (notice that such phrases can occur in predicate position, as in *these are at least twenty eggs*). I propose that the particle *at least*, when applied to α , constructs a new meaning as the union of the alternatives of α that stand in relation to the meaning of α . The alternatives then are just the singleton set, that is, no new alternatives are projected.

- (41) $\llbracket \text{at least } \alpha \rrbracket = \bigcup \{X \mid \langle \llbracket \alpha \rrbracket, X \rangle \in \llbracket \alpha \rrbracket_A\}$
 $\llbracket \text{at least } \alpha \rrbracket_A = \text{the standard alternatives}$

Here, $\bigcup S$ stands for the semantic union of the elements in the set S . This is the same as $\bigcup S$, if the elements of S are given as sets. For example, we have

$$\begin{aligned} & \bigcup \{ \{x \mid \text{BOY}(x)\}, \{x \mid \text{GIRL}(x)\} \} \\ &= \{x \mid \text{BOY}(x)\} \cup \{x \mid \text{GIRL}(x)\} \\ &= \{x \mid \text{BOY}(x) \vee \text{GIRL}(x)\} \end{aligned}$$

The operation \bigcup should have the same effect if the meanings are not given as sets, but as functions. For example, we would like to have

$$\begin{aligned} & \bigcup \{ \lambda x [\text{BOY}(x)], \lambda x [\text{GIRL}(x)] \} \\ &= \lambda x [\text{BOY}(x)] \bigcup \lambda x [\text{GIRL}(x)] \\ &= \lambda x [\text{BOY}(x) \vee \text{GIRL}(x)] \end{aligned}$$

This is achieved if \bigcup , as a connective for functions, the generalized join operation, as defined in Keenan and Faltz (1985):

- (42) (a) If Φ, Ψ are sentences (type t), then $\llbracket \Phi \rrbracket \bigcup \llbracket \Psi \rrbracket = \llbracket \Phi \vee \Psi \rrbracket$
 (b) If α, β are expressions of type $\langle \sigma, \tau \rangle$,
 then $\llbracket \alpha \rrbracket \bigcup \llbracket \beta \rrbracket = \lambda X [\llbracket \alpha \rrbracket(X) \bigcup \llbracket \beta \rrbracket(X)]$
 (c) If S is a set of meanings of a type that can be conjoined by \bigcup , then $\bigcup S$ is the result of conjoining all the elements of S by \bigcup .

For our example we get the following interpretation:

$$\begin{aligned}
 (39) \quad (b) \quad & [[at\ at\ least\ [thréé_F\ boys]]] \\
 & = \mathbf{U}\{P \mid \langle \lambda x[3(x) \wedge \text{BOYS}(x)], P \rangle \in \\
 & \quad \{ \langle \lambda x[n(x) \wedge \text{BOYS}(x)], \lambda x[m(x) \wedge \text{BOYS}(x)] \rangle \mid n \leq_N m \} \} \\
 & = \mathbf{U}\{ \lambda x[m(x) \wedge \text{BOYS}(x)] \mid 3 \leq_N m \} \\
 & = \lambda x[\geq 3(x) \wedge \text{BOYS}(x)] \\
 & [[at\ at\ least\ [thréé_F\ boys]]]_A \\
 & = \{ \langle \lambda x[\geq 3(x) \wedge \text{BOYS}(x)], \lambda x[\geq 3(x) \wedge \text{BOYS}(x)] \rangle \}
 \end{aligned}$$

And we arrive at the following result:

$$\begin{aligned}
 (39) \quad (c) \quad & [[[[\emptyset\ at\ at\ least\ [three_F\ boys]]_1[t_1\ left]]]] \\
 & = \exists x[\geq 3(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)] \\
 & [[[[\emptyset\ at\ at\ least\ [three_F\ boys]]_1[t_1\ left]]]]_A \\
 & = \text{the standard alternatives of the above}
 \end{aligned}$$

This differs from the sentence *three boys left*, as no proper alternatives are generated, hence no scalar implicatures arise. This explains the different behavior that we observed with sentences like (6) and (7).

It may be worthwhile to check how the sentence *three boys left* is derived in the new framework in which alternatives are ordered. The changes are just of technical nature. Here is a derivation:

$$\begin{aligned}
 (43) \quad (a) \quad & [[three\ boys]] = \lambda x[3(x) \wedge \text{BOYS}(x)] \\
 & [[three\ boys]]_A \\
 & = \{ \langle \lambda x[n(x) \wedge \text{BOYS}(x)], \lambda x[m(x) \wedge \text{BOYS}(x)] \rangle \mid n \leq_N m \} \\
 (b) \quad & [[[[\emptyset\ three\ boys]]_1[t_1\ left]]] \\
 & = \exists x[3(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)] \\
 & [[[[\emptyset\ three\ boys]]_1[t_1\ left]]]_A \\
 & = \{ \langle \exists x[n(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)], \exists x[m(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)] \rangle \mid n <_N m \}
 \end{aligned}$$

We have to slightly change the definition of the ASSERT operator given in (32), as the alternatives now are a relation, and the operator has to refer to the field of that relation. I also skip the context parameter c here.

$$\begin{aligned}
 (44) \quad & \text{ASSERT}(M, A): \\
 & - \text{the speaker claims } M; \\
 & - \text{for every alternative } M' \in \text{Field}(A), \ M' \neq M, \text{ the speaker explicitly} \\
 & \text{does not claim } M'.
 \end{aligned}$$

If we apply this ASSERT operator to our example we get the same interpretation as before. The speaker claims that three boys left, and explicitly does not claim propositions of the form ' n boys left', where $n \neq 3$. If $n < 3$, these alternatives are not claimed because they are less informative. If $n > 3$, they are not claimed because the speaker lacks the necessary evidence or knows that they are false.

The crucial difference between a sentence like *three boys left* and *at least three boys left* is that only the first sentence provides proper alternatives for the illocutionary operator. In the second sentence, the alternatives that are introduced by focus are used by the particle *at least* to construct the meaning proper of the sentence. No alternatives are projected beyond that, and hence no scalar implicatures arise.

The analysis of *at least* quantifiers gives us the right result for sentences in which more than one of these quantifiers occur in a sentence, leading to a cumulative interpretation. To see this, consider example (9b), repeated here (with focus on the number word):

- (45) (a) At least thrée boys ate at least séven apples.

The application of the interpretation rules discussed above will lead to the following meaning.

- (45) (b) $\exists y \exists x [\geq 3(y) \wedge \text{BOYS}(y) \wedge \geq 7(x) \wedge \text{APPLES}(x) \wedge \text{EAT}(y, x)]$

In example (39) the focus was on a number word, *three*. But we have seen that *at least* can focus on other expressions too. Let us first consider the following case, in which *at least* is applied to a conjunction of two names.

- (46) (a) At least [Jóhn and Máry]_F left.

Focus on *John and Mary* signals the presence of alternatives, and the particle *at least* presupposes that the alternatives are ordered. The relevant ordering relation here is the part relation on individuals, \leq_i . We then get the following interpretation:

- (46) (b) $[[[_{\text{PN}} \text{Jóhn and Máry}]_F]] = \text{JOHN} \oplus \text{MARY}$

$$[[[_{\text{PN}} \text{Jóhn and Máry}]_F]]_A = \{\langle x, y \rangle \mid x \leq_i y\}$$

- (c) Type lift from e to $\langle \langle e, t \rangle, t \rangle$:

$$[[[_{\text{NP}} \text{Jóhn and Máry}]_F]] = \lambda P[P(\text{JOHN} \oplus \text{MARY})]$$

$$[[[_{\text{NP}} \text{Jóhn and Máry}]_F]] = \{\langle \lambda P[P(x)], \lambda P[P(y)] \rangle \mid x \leq_i y\}$$

- (d) $[[\text{at least } [\text{Jóhn and Máry}]_F]]$
 $= \bigcup \{ P \mid \langle \lambda P [P(\text{JOHN} \oplus \text{MARY})], P \rangle \}$
 $\in \{ \langle \lambda P [P(x)], \lambda P [P(y)] \rangle \mid x \leq_i y \}$
 $= \bigcup \{ \lambda P [P(y)] \mid \text{JOHN} \oplus \text{MARY} \leq_i y \}$
 $= \lambda P \exists y [\text{JOHN} \oplus \text{MARY} \leq_i y \wedge P(y)]$
 $[[\text{at least } [\text{Jóhn and Máry}]_F]]_A = \text{the standard alternatives}$
- (e) $[[[[\text{at least } [\text{Jóhn and Máry}]_F]_1[t_1 \text{ left}]]]]$
 $= \exists y [\text{JOHN} \oplus \text{MARY} \leq_i y \wedge \text{LEFT}(y)]$
 $[[[[\text{at least } [\text{Jóhn and Máry}]_F]_1[t_1 \text{ left}]]]]_A$
 $= \text{the standard alternatives}$

In step (c) we have performed a type shift from the type of entities to the type of quantifiers, which is necessary because the operation \bigcup is not defined for type e . Notice that the alternatives and their ordering are projected in the regular fashion. We arrive at a meaning saying that a sum individual that contains John and Mary left.

Yet another case is presented by the following example:

- (47) (a) $[\text{Three bóys}]_F \text{ left.}$
 (b) $\text{At least } [\text{three bóys}]_F \text{ left.}$

What are the alternatives of *three boys*, and how are they ordered? It is natural to assume that the ordering is the one induced by the part relation on individuals, \leq_i , on sets, which I will call \leq_I .

- (48) If P and Q are sets, then $P \leq_I Q$ iff $\forall x \in P \exists y \in Q [x \leq_i y]$

For example, we have ‘three boys’ \leq_i ‘four boys’, and ‘three boys’ \leq_i ‘three boys and a girl’. With this ordering, (47a) will exclude by scalar implicature that four boys left, or that three boys and a girl left. (47b) will not exclude that, because the alternatives are used by *at least* and then eliminated.

- (49) (a') $[[[[\emptyset \text{ three bóys}]_F]_1[t_1 \text{ left}]]]]$
 $= \exists x [3(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)]$
 $[[[\text{three bóys}]_F]_1[t_1 \text{ left}]]]_A$
 $= \{ \langle \exists x [P(x) \wedge \text{LEFT}(x)], \exists x [Q(x) \wedge \text{LEFT}(x)] \rangle \mid P \leq_I Q \}$
- (b') $[[[[\emptyset \text{ at least } [\text{three bóys}]_F]_1[t_1 \text{ left}]]]]$
 $= \exists x \exists Q [\lambda y [3(y) \wedge \text{BOYS}(y)] \leq_i Q \wedge Q(y) \wedge \text{LEFT}(y)]$
 $[[[[\emptyset \text{ at least } [\text{three bóys}]_F]_1[t_1 \text{ left}]]]]_A$
 $= \text{the standard alternatives}$

In our next example, the ordering relation is introduced by a taxonomic hierarchy. Assume that we are interested in the origin of John. We know that he is an American, we even have evidence that he is a Texan, but we don't quite know yet his origin from within Texas. In this situation one can say:

(50) (a) John is at least a Téxan_F.

We get this interpretation if *a Texan* is a node of a taxonomic relation \leq_{TAX} on which we have, for example, AMERICAN \leq_{TAX} TEXAN, and TEXAN \leq_{TAX} AUSTINITE. We will get the following meaning:

(50) (b) $\exists Q[\text{TEXAN} \leq_{\text{TAX}} Q \wedge Q(\text{JOHN})]$

That is, it is claimed that John has a property *Q* that is at least as specific as TEXAN on the taxonomic scale. Due to the nature of taxonomic scales this will entail that John is a Texan, and also that John is an American.

Finally, let us consider an example in which the order of the alternatives is introduced by a hierarchical relation.

(51) (a) Mary is at least [an associate professor]_F.

The expression in focus, *an associate professor*, introduces the following ordered alternatives:

(51) (b) $[[[\text{an associate professor}]_F]]_A$
 $= \{ \langle \text{ASSIST.PROF, ASSIST.PROF} \rangle, \langle \text{ASSIST.PROF, ASSOC.PROF} \rangle,$
 $\langle \text{ASSIST.PROF, FULLPROF} \rangle,$
 $\langle \text{ASSOC.PROF, ASSOC.PROF} \rangle, \langle \text{ASSOC.PROF, FULLPROF} \rangle,$
 $\langle \text{FULLPROF, FULLPROF} \rangle \}$
 $= \leq_{\text{PROF}}$

This will lead to the following meaning which entails that Mary is either an associate professor or a full professor.

(51) (c) $\exists Q[\text{ASSOC.PROF} \leq_{\text{PROF}} Q \wedge Q(\text{MARY})]$

Notice that in this case, a sentence of the form [...*at least*...] does not entail the same sentence without *at least*. (51a) does not entail that Mary is an associate professor; she might be a full professor.

3.4. At most quantifiers

It seems straightforward to apply the account for *at least* developed in the previous section to downward-entailing quantifiers like *at most three boys*. The meaning that suggests itself for *at most* is the following (compare it with the meaning of *at least* given in (41)):

$$(52) \quad \llbracket \text{at most } \alpha \rrbracket = \cup \{X \mid \langle X, \llbracket \alpha \rrbracket \rangle \in \llbracket \alpha \rrbracket_A\}$$

$$\llbracket \text{at most } \alpha \rrbracket_A = \text{the standard alternatives}$$

That is, *at most* α creates as a meaning the union of all alternative meanings X of α that are at most as strong as the meaning of α . In the case of *at most three_F boys*, these are the alternatives that are denoted by *three boys*, *two boys* and *one boy*.

$$(53) \quad \begin{aligned} (a) \quad & \llbracket \text{three}_F \text{ boys} \rrbracket = \lambda x [3(x) \wedge \text{BOYS}(x)] \\ & \llbracket \text{three}_F \text{ boys} \rrbracket_A \\ & = \{ \langle \lambda x [n(x) \wedge \text{BOYS}(x)], \lambda x [m(x) \wedge \text{BOYS}(x)] \rangle \mid n \leq_N m \} \\ (b) \quad & \llbracket \text{at most } [\text{three}_F \text{ boys}] \rrbracket = \lambda x [\leq 3(x) \wedge \text{BOYS}(x)] \\ & \llbracket \text{at most } [\text{three}_F \text{ boys}] \rrbracket_A = \text{the standard alternatives} \end{aligned}$$

We then get the following meaning for the sentence (54a). If this sentence is asserted, it is claimed that there was an individual x consisting of at most three boys such that x left.

$$(54) \quad \begin{aligned} (a) \quad & \text{At most three}_F \text{ boys left.} \\ (b) \quad & \llbracket [\llbracket \emptyset \text{ at most } [\text{three}_F \text{ boys}] \rrbracket]_1 [t_1 \text{ left}] \rrbracket \\ & = \exists x [\leq 3(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)] \end{aligned}$$

There are at least two problems with this. One concerns the proposed meaning: It entails that there was at least one boy that left. But the following sentence does not express a contradiction:

$$(55) \quad \text{The evidence we have shows that at most three}_F \text{ boys left, but we are not sure whether any boy left.}$$

The GQ analysis, $\#(\text{BOY} \cap \text{LEFT}) \leq 3$, fares better in this respect, as it does not entail that a boy left (notice that if the intersection is empty, we have $\#(\text{BOY} \cap \text{LEFT}) = 0$, and $0 \leq 3$).

The second problem is even more severe. It concerns the fact that (54b) does not exclude that more than three boys left. As we have seen, cumulativity of predicates like *left* will ensure that, if four boys left, then the proposition ‘three boys left’ is true as well.

Perhaps we can exclude propositions like ‘four boys left’ by constructing suitable alternatives. For example, we might assume a rule for *at most* that keeps the alternatives alive:

$$(56) \quad \begin{aligned} \llbracket \text{at most } \alpha \rrbracket &= \cup \{X \mid X, \llbracket \alpha \rrbracket \rangle \in \llbracket \alpha \rrbracket_A\} \\ \llbracket \text{at most } \alpha \rrbracket_A &= \llbracket \alpha \rrbracket_A \end{aligned}$$

The ASSERT operator then could state that there are reasons for the speaker not to claim the alternatives that are not entailed by the meaning. For our example, this amounts to saying that there are reasons not to claim propositions of the form ' n boys left', for $n > 3$. Hence, these propositions would be excluded by scalar implicature, just as with the sentence *three boys left* in the theory introduced in Section 3.1.

But *three boys left* and *at most thrée_F boys left* differ in their semantic behavior. The second sentence expresses a stronger commitment to the exclusion of alternatives. It does not just indicate that the speaker has reasons not to claim these alternative propositions, but more specifically says that these propositions are false. This shows up when we try to cancel the additional meaning component. (57b) is a contradiction, in contrast to (57a).

- (57) (a) Three boys left, perhaps even *fóur_F*.
 (b) *At most thrée_F boys left, perhaps even *fóur_F*.

How can we express the different status of the alternatives in these cases? One difference is that the alternatives were introduced in different ways. In (57a), they are introduced by the meaning of number words (they belong to a Horn scale). In (57b), we find that in addition focus is involved. We may now distinguish between alternatives that are just introduced by Horn scales, and alternatives that are introduced by focus. In the latter case, alternatives that are not entailed by the meaning proper are not only explicitly not asserted, but explicitly denied. This suggests the following rule for the ASSERT operator:

- (58) $\text{ASSERT}(M, A) =$
- (a) If the alternatives were introduced by focus:
 Speaker claims M , and for every $M' \in A$ such that $M \not\Rightarrow M'$,
 Speaker claims $\neg M'$.
 - (b) Otherwise, Speaker claims M ,
 and, for every $M' \in A$, $M' \neq M$, speaker has reasons not to
 claim M' .

There may be some evidence for the particular role of focus in introducing alternatives. Van Kuppevelt (1996) observes that if a number word is the focus of an answer (in his terms, is part of the comment), then we have an "exact" interpretation. This explains the following contrast:

- (59) (a) [Who has fourteen children?]
Nígelf has fourteen children. In fact, he has *fifteen_F*.
 (b) [How many children does Nigel have?]
 *Nigel has *fóurteen_F* children. In fact, he has *fifteen_F*.

However, we find that (60) is fine, in contrast to (59).

(60) [How many children does Nigel have?]

Nigel has fourteen_F children, perhaps even fifteen_F.

It seems that, contrary to van Kuppevelt, focussation does not necessarily lead to an “exactly” reading. Under such an interpretation, (60) would be contradictory, just as **Nigel has exactly fourteen children, perhaps even fifteen*. The only way to make sense of this is to assume that the first clause of (60) excludes by scalar implicature, and not by meaning, that Nigel has more children. The contrast observed in (59) has to be explained in different ways. In (59a), the first clause is motivated in its context because it simply takes over the background of the question, *have fourteen children*, which indicates maximal coherence of the answer to the question. (An answer like *Nigel has fifteen children* is an indirect answer from which the direct answer can be inferred.) In (59b) there is no independent reason to give the answer *Nigel has fourteen children* in the first place, and therefore the interchange is bad.

Why, then, is (57b) bad, or a sentence like **Nigel has at most fourteen_F children, perhaps even fifteen_F*? The obvious reason is that the first clause already excludes explicitly that Nigel has more than fourteen children. The second clause then expresses a blatant contradiction to the first clause.

The use of alternatives to capture the meaning of *at most* is also implausible because of the following reason. Clearly, the meanings of *at least* and *at most* should be related. But we have seen in the preceding section that we should assume that *at least* makes use of the alternatives introduced by focus, leaving no alternatives that could trigger scalar implicatures. Similarly, we should expect that *at most* makes use of the alternatives and does not leave any that could trigger scalar implicature.

One way to deal with the special meaning contribution of *at most* is the following. We assume that semantic interpretations do not just give us truth conditions, but also “falsity conditions”. That is, the interpretation of an expression is a pair that specifies the truth-conditional meaning and the falsity-conditional meaning. This suggestion has been made for semantic interpretation within Situation Semantics, cf., e.g., Barwise (1987). It can be used to characterize the meaning of particles like *at most* by assuming that this particle does not have any effect on the truth conditions, but rather, on the falsity conditions. A sentence like *at most three_F boys left* says that the proposition ‘more than three boys left’ is false, and it leaves the truth conditions unspecified.

We might be able to develop an account along these lines. However, it has to face some fundamental problems, and it is unclear whether a principled solution can be given. Going from mere truth conditions to truth/falsity conditions forces a fundamental change in the semantic representation, because now every expression should be characterized both in truth conditions and in falsity conditions. But then it is unclear what the *truth* conditions of a sentence like *at most three_F boys came* should be. We could give a straightforward com-

positional analysis along the following lines: The sentence has as falsity condition $\exists x[> n(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)]$ is false, and as truth condition that $\exists x[\leq 3(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)]$ is true. However, notice that this would wrongly entail that at least one boy left.

I would rather like to propose that *at most*-sentences do not have any meaning proper, but rather come with a type of alternatives that are marked as being excluded by the speaker. Let us assume that alternatives can have a **polarity**, a value that is either positive, marked “+”, negative, marked “−”, or neutral. Technically, positive and negative alternatives are pairs of a polarity marker and a meaning, but instead of $\langle +, a \rangle$ and $\langle -, a \rangle$ I will simply write $+a$ and $-a$, respectively.

The rule for *at most* now can be given as follows. I use the notation $-A$ to indicate that the set of alternatives A are all assigned the polarity marker “−”, and similarly $+A$.

$$(61) \quad \llbracket \text{at most } \alpha \rrbracket = \text{undefined}$$

$$\llbracket \text{at most } \alpha \rrbracket_A = -\{X \in \text{Field}(\llbracket \alpha \rrbracket_A) \mid \neg \langle X, \llbracket \alpha \rrbracket \rangle \in \llbracket \alpha \rrbracket_A\}$$

That is, we reduce the set of alternatives of α to all those that are not smaller or equal to the meaning of α , and we mark these alternatives as negative.

Let me illustrate the derivation of example (54a) in this new framework.

- $$(62) \quad \begin{aligned} (a) \quad & \llbracket \text{thréé}_F \text{ boys} \rrbracket = \lambda x[3(x) \wedge \text{BOYS}(x)] \\ & \llbracket \text{thréé}_F \text{ boys} \rrbracket_A \\ & = \{\langle \lambda x[n(x) \wedge \text{BOYS}(x)], \lambda x[m(x) \wedge \text{BOYS}(x)] \rangle \mid n \leq_N m\} \\ (b) \quad & \llbracket \text{at most thrée}_F \text{ boys} \rrbracket: \text{undefined} \\ & \llbracket \text{at most thrée}_F \text{ boys} \rrbracket_A \\ & = -\{X \in \text{Field}(\llbracket \text{thréé}_F \text{ boys} \rrbracket_A) \mid \neg \langle X, \llbracket \text{thréé}_F \text{ boys} \rrbracket \rangle \\ & \quad \in \llbracket \text{thréé}_F \text{ boys} \rrbracket_A\} \\ & = -\{\lambda x[n(x) \wedge \text{BOYS}(x)] \mid 3 <_N n\} \\ & = \{-\lambda x[n(x) \wedge \text{BOYS}(x)] \mid 3 <_N n\} \\ (c) \quad & \llbracket \emptyset_{\text{DET}} \rrbracket = \lambda Q \lambda P \exists x[Q(x) \wedge P(x)] \\ & \llbracket \emptyset_{\text{DET}} \rrbracket = \text{the standard alternatives} \\ (d) \quad & \llbracket [\emptyset \text{ at most thrée}_F \text{ boys}] \rrbracket = \text{undefined} \\ & \llbracket [\emptyset \text{ at most thrée}_F \text{ boys}] \rrbracket_A \\ & = \{-\lambda P \exists x[n(x) \wedge \text{BOYS}(x) \wedge P(x)] \mid 3 <_N n\} \\ (e) \quad & \llbracket [t_1 \text{ left}] \rrbracket = \text{LEFT}(x_1) \\ & \llbracket [t_1 \text{ left}] \rrbracket_A = \{\text{LEFT}(x_1)\} \\ (f) \quad & \llbracket [[\emptyset \text{ at most thrée}_F \text{ boys}]_1 [t_1 \text{ left}]] \rrbracket = \text{undefined} \\ & \llbracket [[\emptyset \text{ at most thrée}_F \text{ boys}]_1 [t_1 \text{ left}]] \rrbracket_A \\ & = \{-\exists x[n(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)] \mid 3 <_N n\} \end{aligned}$$

The definition of the ASSERT operator now contains in addition the following clause:

- (63) ASSERT(M, A): If M is undefined, then for every $-M' \in A$: Speaker claims $\neg M'$

In the case at hand this amounts to the following:

- (62) (g) For all $M' \in \{-\exists x[n(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)] \mid 3 <_N n\}$, Speaker claims $\neg M$, that is, Speaker claims $\neg \exists x[> 3(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)]$

That is, Speaker claims that there is no sum individual consisting of more than three boys that left. No scalar implicature arises in this case, as we do not compare any meaning that is actually expressed with alternative meanings.

We have argued above that *at most* does not lead to existential presuppositions. However, in many cases *at most* seems to be close to having such presuppositions. We may express this by saying that, in addition to the meaning rule in (61) we have the following meaning rule:

- (64) $[[\text{at most } \alpha]]: \cup\{X \mid \langle X, [[\alpha]] \rangle \in [[\alpha]]_A\}$
 $[[\text{at most } \alpha]]_A = -\{X \mid \langle [[\alpha]], X \rangle \in [[\alpha]]_A \wedge X \neq [[\alpha]]\}$

Our example *at most thrée_F boys left* would then have the meaning ' $\exists x[\leq 3(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)]$ ', which entails that (at least) one boy left. Notice that no scalar implicature will arise under this analysis either, because this meaning does not stand in any relation of semantic strength to the alternative meanings, which are of the form $\neg \exists x[n(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)]$, with $n > 3$.

One piece of evidence that *at most* can be understood as having an existential presupposition comes from the fact that *at most* NPs can introduce discourse referents. However, they are not quite as good as NPs based on *at least*, and it might be that the pronoun in these cases is shorthand for definite descriptions (here, *the boys that left*) which can be accommodated if their presupposition is not satisfied.

- (65) (a) ?At most three boys left. They found the play boring.
 (b) At least three boys left. They found the play boring.

The introduction of polarity-marked alternatives may appear as heavy machinery for cases that GQ theory treated in a rather elegant way all along. This is certainly true when we just consider examples like *at most thrée_F boys left*. But it gives us the proper representation in other cases, in which the GQ representation failed.

First of all, it gives us the proper meanings in cases in which we have more than one *at most*-NPs. Consider the following example (I just specify the alternatives here):

- (66) (a) At most *thréé_F* boys ate most *séven_F* apples.
 (b) $[[[\emptyset \text{ at most } \textit{séven}_F \text{ apples}]_2[t_1 \text{ ate } t_2]]]_A$
 (c) $= \{-\exists x[n(x) \wedge \text{APPLES}(x) \wedge \text{ATE}(x)(x_1)] \mid n > 7\}$
 (d) $[[[\emptyset \text{ at most } \textit{thréé}_F \text{ boys}]]_A$
 $= \{-\lambda X \exists x[n(x) \wedge \text{BOYS}(x) \wedge X(x)] \mid n > 3\}$
 (e) $[[[\emptyset \text{ at most } \textit{thréé}_F \text{ boys}]_1[[\emptyset \text{ at most } \textit{séven}_F \text{ apples}]_2[t_1 \text{ ate } t_2]]]]_A$
 $= \{-\exists y \exists x[n(x) \wedge \text{BOYS}(x) \wedge m(y) \wedge \text{APPLES}(y) \wedge \text{ATE}(y)(x)] \mid$
 $n > 3, m > 7\}$

I assume here that the combination of two negative alternatives will lead to a negative alternative, following the rule

$$(67) \quad f(-X, -Y) = -f(X, Y).$$

The assertion of (66) gives us the following:

- (66) (f) ASSERT((66)):
 For all $M \in \{-\exists y \exists x[n(x) \wedge \text{BOYS}(x) \wedge m(y) \wedge \text{APPLES}(y) \wedge \text{ATE}(y)(x)] \mid n > 3 \text{ or } m > 7\}$,
 Speaker claims $\neg M$,
 that is, Speaker claims
 $\neg \exists y \exists x[>3(x) \wedge \text{BOYS}(x) \wedge \text{APPLES}(y) \wedge \text{ATE}(y)(x)]$, and
 $\neg \exists y \exists x[\text{BOYS}(x) \wedge >5(y) \wedge \text{APPLES}(y) \wedge \text{ATE}(y)(x)]$

These are the correct truth conditions: It is denied that more than three boys ate apples, and that more than seven apples were eaten by boys.

Let us turn to cases in which the focus determines a different type of alternatives, as in the following example. Recall that the relation \leq_I is a relation for sets of individuals, based on the part relation on individuals, \leq_i (cf. (47)).

- (68) (a) At most [*three bóys*]_F left.
 (b) $[[\text{at most } [\textit{three bóys}]_F]]_A$
 $= -\{P \in \text{Field}([[\textit{three bóys}]_F]_A) \mid \neg \langle P, [[\textit{three bóys}]_F] \rangle \in$
 $[[\textit{three bóys}]_F]_A\}$
 $= \{-P \mid \neg P \leq_I \lambda x[3(x) \wedge \text{BOYS}(x)]\}$
 (c) $[[[\emptyset \text{ at most } [\textit{three bóys}]_F]_1[t_1 \text{ left}]]]_A$
 $= \{-\exists x[P(x) \wedge \text{LEFT}(x)] \mid \neg P \leq_I \lambda x[3(x) \wedge \text{BOYS}(x)]\}$

This set contains all propositions of the form ‘some P left’, where P ranges over sets that are not an I -part of the set that contains sum individuals consisting of three boys. That is, we will exclude propositions like ‘three boys left’, ‘two boys left’, ‘one boy left’, and ‘John left’ (if John is a boy) from this set. But propositions like ‘four boys left’, or ‘three boys and a girl left’, or ‘Sue left’ (if Sue is not a boy) will be in this set. Asserting (68) amounts to denying these propositions. (I have assumed that the field of $<_I$ is the set of all subsets of the universe, and hence I have omitted this condition.)⁶

Finally, notice that we get the right representation for a sentence based on a hierarchical relation:

- (69) (a) Mary is at most [an associate professor]_F
 (b) $[[\text{Mary is at most [an associate professor]}]_F]_A$
 $= \{-X(\text{MARY}) \mid X \in \text{Field}(\leq_{\text{PROF}}) \wedge \neg(X, \text{ASSOC.PROF})\}$

The assertion of this sentence will lead to the claim that Mary does not have a higher rank than the one of an associate professor.

3.5. Other particles and quantifiers

In the preceding section I have introduced a semantic theory for the particle *at most*. In this section I will show how it can be extended to handle other particles and quantifiers as well.

First, if we want to give a parallel treatment to *at least* and *at most*, then we might replace the meaning rule for *at least* given in (41) by the following rule:

- (70) $[[\text{at least } \alpha]] = \text{undefined}$
 $[[\text{at least } \alpha]] = +\{X \mid \langle X, [[\alpha]] \rangle \in [[\alpha]]_A\}$

The ASSERT rule should then be extended as follows for positive alternatives:

- (71) ASSERT(M, A): If M is undefined, and if A contains positively marked alternatives, then Speaker claims that there is one $+M' \in A$ such that M' is true.

Under this analysis, the sentence *at least three_F boys left* has positively marked alternatives ‘three boys left’, ‘two boys left’, ‘one boy left’. If asserted, the speaker is committed to the claim that there is one alternative that is true. Notice that these are the same truth conditions as before, but now expressed by way of positively marked alternatives. We can explain the slightly different status of *at least*

⁶ The reason why I did not define the alternatives as $-\{X \mid \langle [[\alpha]], X \rangle \in [[\alpha]]_A \wedge X \neq [[\alpha]]\}$, but rather by the complement operation as in (61), is that under this definition, (68c) would not exclude propositions like ‘three girls left’, or ‘Sue left’.

three boys and *at most three boys* discussed in (65), as the claim that there is one alternative proposition that can be asserted entails that, when this proposition is in fact asserted, a discourse referent for the indefinite is introduced. We find a similar introduction of discourse referents in disjunctions, as in the following case:

- (72) Pedro owns a donkey, or a he owns a horse. In any case, he beats it/the animal.

The particle *more than* can be analyzed as follows; compare this with the meaning rule for *at least*.

- (73) $[[\text{more than } \alpha]] = \text{undefined}$
 $[[\text{more than } \alpha]]_A = +\{X \mid \langle [[\alpha]], X \rangle \in [[\alpha]]_A \wedge X \neq [[\alpha]]_A\}$

The particle *less than* will be analyzed as follows; compare with *at most* as defined in (61) and (68):

- (74) $[[\text{less than } \alpha]] = \text{undefined}$
 $[[\text{less than } \alpha]]_A$
 $= -\{X \in \text{Field}([[\alpha]]_A) \mid \neg \langle X, [[\alpha]] \rangle \in [[\alpha]]_A \vee X = [[\alpha]]_A\}$

The two-place particle *between* can be analyzed as a combination of *at least* and *at most*:

- (75) $[[\text{between } \alpha \text{ and } \beta]] = \text{undefined}$
 $[[\text{between } \alpha \text{ and } \beta]]_A = +\{X \mid \langle X, [[\alpha]] \rangle \in [[\alpha]]_A\} \cup$
 $- \{X \in \text{Field}([[\beta]]_A) \mid \neg \langle [[\beta]], X \rangle \in [[\beta]]_A\}$
 $= [[\text{at least } \alpha]]_A \cup [[\text{at most } \beta]]_A$

- (76) $[[\text{exactly } \alpha]] = \text{undefined}$
 $[[\text{exactly } \alpha]]_A = +\{X \mid X, [[\alpha]] \rangle \in [[\alpha]]_A\} \cup -\{X \in \text{Field}([[\alpha]]_A) \mid$
 $\neg \langle [[\alpha]], X \rangle \in [[\alpha]]_A\}$
 $= [[\text{at least } \alpha]]_A \cup [[\text{at most } \alpha]]_A$

In this case the alternatives will end up containing both positive and negative elements. As an example, consider the interpretation of *between three and five boys ate between seven and ten apples*:

- (77) (a) $\llbracket \text{thrée}_F \rrbracket = \lambda P \lambda x [3(x) \wedge P(x)]$
 $\llbracket \text{thrée}_F \rrbracket_A$
 $= \{ \langle \lambda P \lambda x [n(x) \wedge P(x)], \lambda P \lambda x [m(x) \wedge P(x)] \rangle \mid n <_N m \}$
- (b) $\llbracket \text{five}_F \rrbracket = \lambda P \lambda x [5(x) \wedge P(x)]$
 $\llbracket \text{five}_F \rrbracket_A$
 $= \{ \langle \lambda P \lambda x [n(x) \wedge P(x)], \lambda P \lambda x [m(x) \wedge P(x)] \rangle \mid |n| <_N |m| \}$
- (c) $\llbracket \text{between thrée}_F \text{ and five}_F \rrbracket_A$
 $= +\{X \mid \langle X, \llbracket \text{thrée}_F \rrbracket \rangle \in \llbracket \text{thrée}_F \rrbracket_A\} \cup$
 $- \{X \in \text{Field}(\llbracket \text{five}_F \rrbracket_A) \mid \neg \langle \llbracket \text{five}_F \rrbracket, X \rangle \in \llbracket \text{five}_F \rrbracket_A\}$
 $= \{ +\lambda P \lambda x [n(x) \wedge P(x)] \mid 3 \leq_N n \} \cup$
 $\{-\lambda P \lambda x [n(x) \wedge P(x)] \mid 5 <_N n\}$
- (d) $\llbracket \text{between thrée}_F \text{ and five}_F \text{ boys} \rrbracket_A$
 $= \{ +\lambda x [n(x) \wedge \text{BOYS}(x)] \mid 3 \leq_N n \} \cup$
 $\{-\lambda x [n(x) \wedge \text{BOYS}(x)] \mid 5 <_N n\}$
- (e) $\llbracket \emptyset \text{ between thrée}_F \text{ and five}_F \text{ boys} \rrbracket_A$
 $= \{ +\lambda P \exists x [n(x) \wedge \text{BOYS}(x) \wedge P(x)] \mid 3 \leq_N n \} \cup$
 $\{-\lambda P \exists x [n(x) \wedge \text{BOYS}(x) \wedge P(x)] \mid 5 <_N n\}$
- (f) $\llbracket \emptyset \text{ between séven}_F \text{ and tén}_F \text{ apples} \rrbracket_A$
 $= \{ +\lambda P \exists x [n(x) \wedge \text{APPLES}(x) \wedge P(x)] \mid 7 \leq_N n \}$
 $\cup \{-\lambda P \exists x [n(x) \wedge \text{APPLES}(x) \wedge P(x)] \mid 10 <_N n\}$
- (g) $\llbracket [\emptyset \text{ between séven}_F \text{ and tén}_F \text{ apples}]_2 [t_1 \text{ ate } t_2] \rrbracket_A$
 $= \{ +\exists x [n(x) \wedge \text{APPLES}(x) \wedge \text{ATE}(x_1, x)] \mid 7 \leq_N n \}$
 $\cup \{-\exists x [n(x) \wedge \text{APPLES}(x) \wedge \text{ATE}(x_1, x)] \mid 10 <_N n\}$
- (h) $\llbracket [\emptyset \text{ between thrée}_F \text{ and five}_F \text{ boys}]_1 [\emptyset \text{ between séven}_F \text{ and tén}_F \text{ apples}]_2 [t_1 \text{ ate } t_2] \rrbracket_A$
 $= \{ +\exists x \exists y [n(x) \wedge \text{BOYS}(x) \wedge m(y) \wedge \text{APPLES}(y) \wedge \text{ATE}(x, y)] \mid$
 $3 \leq_N n \text{ and } 7 \leq_N m \}$
 $\cup \{-\exists x \exists y [n(x) \wedge \text{BOYS}(x) \wedge m(y) \wedge \text{APPLES}(y) \wedge$
 $\text{ATE}(x, y)] \mid 5 <_N n \text{ or } 10 <_N m\}$

We get this result under the following assumption about how positive and negative alternatives should be combined, which says that whenever a negative alternative is combined with any other alternative, the result will be negative. A positive alternative can be obtained only by combining positive alternatives.

$$(78) \quad f(-X, -Y) = f(-X, +Y) = f(+X, -Y) = -f(X, Y);$$

$$f(+X, +Y) = +f(X, Y)$$

If asserted, (77) amounts to the following according to (63) and (71). The speaker claims that there is a proposition of the form '*n* boys ate *m* apples', with $3 \leq n$ and $7 \leq m$, that is true, but all propositions of the form '*n* boys ate *m* apples', where either $5 < n$ or $10 < m$, is false.

We will also have to account for the combination of negative and positive alternatives with neutral alternatives, as in the following sentences:

(79) (a) At least three boys ate seven apples.

(b) At most three boys ate seven apples.

In the cumulative interpretation, (79a,b) say that seven apples were eaten by boys, and in addition, (a) three or more boys participated in the eating and (b) it is not the case that more than three boys participated in the eating. We get these interpretations by assuming that non-neutral alternatives take precedence over neutral ones:

$$(80) \quad f(X, \pm Y) = f(\pm X, Y) = \pm f(X, Y)$$

One interesting consequence of this treatment of expressions like *at most*, *at least*, *exactly*, and *between n and m* is that on the semantic level they are essentially indefinites. There is one well-known property that they share with other indefinites, namely, they occur in *there*-sentences, in contrast to true quantifiers.

(81) (a) There were three / at least three / at most three / exactly three / between three and five books on the table.

(b) *There was the book / every book on the table.

(c) *There were most books on the table.

There exist a number of attempts to characterize this distribution semantically. A recent one, McNally (to appear), essentially assumes that *there*-sentences have predicates as subjects (type $\langle e, t \rangle$). This excludes true quantifiers from this position. Notice that the theory developed here analyzes expressions like *three books*, *at most three books*, or *between three and five books* as predicates, and hence predicts that we find these expressions as the subjects of *there*-sentences.

3.6. The translation of alternatives to meanings

Let me turn now to an important general point, and a final twist in our story. One feature of the theory developed here is that expressions like *at least*, *at most*, *exactly*, etc. are interpreted in an two-pronged way. The particles themselves, together with the alternatives introduced by a focus within their scope, create a certain type of alternative set. Another operator, an illocutionary operator like *ASSERT*, makes use of this information and transforms it into something that can be related to the usual truth conditions that we usually ascribe to these sentences. For example, the alternatives in (62f) were transformed by *ASSERT* to the formula $\neg\exists x[> 3(x) \wedge \text{BOYS}(x) \wedge \text{LEFT}(x)]$.

So far we have assumed that illocutionary operators perform that transformation, and as we have seen that these particles can block scalar implicatures that presumably arise by illocutionary operations, this seems to be quite plausible. However, the particles in question can be interpreted in terms of truth conditions even when no illocutionary operator is present. Consider the following example with the particle *at most*:

(82) Mary was aware that at most three boys were present.

The prominent reading of (82) is one in which can be described as ‘Mary was aware that the number of boys that were present is at most three’. We need the truth-conditional interpretation within the description of Mary’s belief, even though the embedded clause is not directly asserted. One way of dealing with that is to assume the creation of truth conditions from a set of alternatives can be enacted without the presence of an illocutionary operator. As we need propositions to express that rule, it is plausible to assume that, as soon as we arrive in the semantic derivation at the propositional level (type *t*), the marked alternatives are translated to truth conditions.

(83) If α is of type *t*, $[[\alpha]]$ is undefined, and $[[\alpha]]_A$ contains \pm -marked alternatives, then take as new meaning $[[\alpha]]$ the following:

$$\cup\{\{p \mid +p \in [[\alpha]]_A\} \cup \{\neg p \mid -p \in [[\alpha]]_A\}\},$$

and as the new alternatives $[[\alpha]]_A$ the standard alternatives (that is, $\{[[\alpha]], \langle [[\alpha]], [[\alpha]] \rangle\}$).

This rule is now independent of any illocutionary operator, and hence it allows us to deal with cases like (82). It gives us the right result in root sentences like *At most three_{EF} boys were present* as well: they express a proposition, here ‘it is not the case that more than three boys were present’. The *ASSERT* operator is applied to this proposition, and as it does not have proper alternatives, no scalar implicature will arise.

The point at which marked alternatives are translated into meanings cannot be identified as the syntactic category *S*. Consider the following example (from the British National Corpus):

- (84) In 1621 the French mathematician Bachet de Meziriac observed that apparently every positive number could be expressed as a sum of at most four squares.

The embedded clause certainly is not intended to mean: 'The highest n such that every positive number can be expressed as a sum of n squares is 4'. Rather, it should express the following: 'Every positive number can be expressed by a sum $x_1^2 + x_2^2 + \dots + x_n^2$, where $n \leq 4$ ', that is, $x_1^2 + x_2^2 + \dots + x_n^2$ is a sum of squares y , and y has the property that there is no n , $n > 4$, so that n is the number of y . The critical point is that the last NP, *at most four squares*, introduces a referent y , and the description of this referent is that it is a sum of squares that does not contain more than 4 elements. Hence the point at which the alternatives are translated to a truth-conditional meaning is within the application of the content of the NP, *at most four squares*, to its referent. This is not a clause in any syntactic sense, but it is a proposition (type t) in semantic interpretation. Hence the translation of alternatives to meanings follows semantic criteria, not syntactic ones.

We find similar narrow-scope interpretations for other particles. Consider the following contrast:

- (85) (a) He only can play the piano with his left_F hand.
(b) He can play the piano with only his left_F hand.

Example (85b) can be paraphrased as: 'He can play the piano with x , and x is only his left hand', that is, x does not contain his right hand.

Finally, I would like to mention that the particles under consideration are all focus-sensitive, and they share with other focus-sensitive particles that both their scope and their focus matter for interpretation (in (85a,b), the particle *only* had the same focus, but different scope). We have seen the influence of focus above (cf. *At most three_F boys left* vs. *At most [three boys]_F left*). The scope is indicated by the syntactic position of the particle. Contrast example (82) with the following:

- (86) Mary was at most aware that three_F boys were present.

This is to be paraphrased as: 'There is no n , $n > 3$, such that Mary was aware that n boys were present'.

I should add that it seems that not only \pm -marked alternatives are subject to narrow-scope transformation to truth conditions. We also find this with normal number words that arguably introduce unmarked alternatives. Notice that the following sentence is not pragmatically odd:

- (87) Three boys ate seven apples, and four boys ate nine apples.

We talk here about two different groups of boys, and two different groups of apples. Scalar implicature applies on the level of the description of those groups, not on the level of the clause. The paraphrase of the first clause of (87) is 'There is an x and a

y and x ate y, and x are three boys, and y are seven apples'. The subpredications 'x are three boys' and 'y are seven apples' are strengthened by scalar implicature to 'x are not more than three boys' and 'y are not more than seven apples'. What is important here is that we have two independent applications of scalar implicature. The second clause of (87) then introduces another group of boys and apples, with independent applications of scalar implicatures. Of course, there must be some criteria that allow us to distinguish between the two groups of boys.

4. Conclusion

In this article I tried to show that many expressions that were analyzed as determiners in Generalized Quantifier theory acquire their quantificational effect in a rather indirect way. They are particles that associate with an expression with focus that introduces alternatives, and they exploit these alternatives at different positions. This explains their syntactic distribution, which is considerably wider than the one of determiners. It also explains why meanings of sentences that contain them vary in the typical ways that we observe with other focus-sensitive particles. I tried to show why these particles do not trigger the scalar implicatures that we normally find with number words. We had to work with the concept of ordered alternatives, and for the treatment of downward-entailing particles, like *at most*, we had to introduce the concept of positively marked and negatively marked alternatives. And we had to assume that alternatives can be translated into regular meanings at certain points in the syntactic derivation.

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CHAPTER 11

On an Illocutionary Connective *Datte**

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1. Introduction

The aim of this paper is to present a unified analysis of a Japanese connective *datte* which plays semantic and pragmatic functions in dialogues and to stop the controversy over the categorization of the connective within the framework of speech act theory.¹ *Datte* has been extensively studied in Maynard (1993, pp. 99–119), Hasunuma (1995) and Oki (1996) with other relevant connectives such as *demo* (= “but”), *dakara* (= “because”), etc., mainly in the framework of conversational analysis. They have categorized the connective into a connective of ‘objection’ and/or that of ‘supplementary explanation’ with or without the perspectives of speech acts.² Maynard (1993, p. 99) correctly illustrates that “*datte*’s *raison d’être* lies in the speaker’s intention to declare his or her own speech action in conversation”, however, she neglects the possible demarcation between the speech act of ‘objection’ and that of ‘supplementary explanation’. She treats the consecutive speech acts as if they were an inseparable unit and claims that its function is “supporting the position the speaker is associated with, with the intention to justify one’s own position” (Maynard, 1993, p. 99).³ Hasunuma (1995) is in line with Maynard (1993) regarding this matter. Oki (1996, p. 103) is the first that distinguishes the levels of interpretation to demarcate those two meanings, suggesting that *datte* expresses ‘explanation of reasons’ at the propositional level and describes ‘assertion’ against a partner’s intention. She also suggests that *datte* is related to propositional contents but plays the role of modal element (Oki, 1996, p. 104). However, her study is not general enough to characterize and further specify, what she calls, the modal element. In this paper, *datte* is assumed to represent the compound speech acts consisting of two consecutive speech acts, namely the speech act with assertive illocutionary force of ‘objection’, and that with assertive illocutionary force of ‘supplementary explanation’ or ‘justification’. In this sense, this paper succeeds Maynard’s view of *datte*’s *raison d’être* and Oki’s demarcation of the semantico-pragmatic functions of the connective, but diverges from the former in the treatment of demarcation, and from the latter in the way to demarcate two speech acts represented by single expression and in the degree of generalization and specification in the dialogical representation.

This paper is composed of five sections. In the next section, Maynard (1993), Hasunuma (1995) and Oki (1996) are critically reviewed one by one concentrating on the semantic distinction between the reading of ‘objection’ and that of ‘supple-

¹ As for the recent study of speech act theory, see Vanderveken (1990).

² Maynard (1993) and Hasunuma (1995) take the view to determine the meaning of *datte* according to the presence or absence of the speaker turn. Oki (1996) proposes the reduction of oppositive use into the use of supplementary explanation and categorizes *datte* as a member of explanatory connectives.

³ Problems of her analyses of *datte* lie in her assumption concerning the relation between the semantic and pragmatic aspect of DM indicators. She maintains their relation is “that of reciprocal and symbiotic action, each influencing and being influenced simultaneously” (Maynard, 1993, p. 99). Thus, demarcation between semantic and pragmatic meanings of the connective is neglected.

mentary explanation' from the view of speech act theory. Especially, Maynard's treatment of 'convergence', Hasunuma's analysis of 'compromise' and Oki's hypothesis of 'deletion' are questioned in turn. In Section 3, *datte* will be proved not to have the lexical meaning of 'objection' compared with simple oppositive connective *demo*. It will be demonstrated that utterance-initial *datte* functions as a substitute for the utterance preceding the connective then takes over the reading of 'objection' that the utterance originally has. In Section 4, a unified analysis of *datte* will be proposed within the framework of speech act theory. In Section 5, concluding remarks are provided.

2. Previous studies

Previous studies except Oki (1996) failed or neglected to conceive the distinction between truth-conditional and non-truth conditional meanings of the connective *datte* and treated the two different readings on the same level, which led the writers to the wrong directions and drove them to the inappropriate proposals such as Maynard's 'convergence' and Hasunuma's 'compromise', and insufficient hypothesis such as Oki's 'deletion'.

2.1. Maynard's 'convergence'

Let us examine Maynard (1993, p. 103)'s proposal first. She proposes [*X. datte Y*] structure, where [*X*] is defined as "the (assumedly) shared information suggested or mentioned in prior text", and [*Y*] is defined as the utterance following *datte* which "provides a reasonable reason/cause for [*X*]". For instance, as to the discourse (1) which she categorizes as 'convergence'-type, she presents the following claims:

B offers support which can be interpreted to be reason/cause for A to take a vacation. At the same time it expresses an opposition (or a challenge) to A's doubt (of perhaps not taking a vacation). Here, the relationship between [*X*] and [*Y*] seems to result from the convergence of both "because" and "but" interpretation of *datte*. (Maynard, 1993, p. 105)⁴

(1)⁵

A₁: *Sukoshi kyuuka o toroo ka naa.* [*X*]
 A little vacation ACC take(INT) Q IP
 (I'm wondering if I should take a small vacation.)

⁴ Here, 'doubt' is not a proper word to describe A's attitude. It will be more appropriate to use "A's hesitation" for it.

⁵ Abbreviations in the glosses are arranged so as to conform them to the common usage in linguistics and are listed at the end of the paper. Thus, some of them are different from those of Maynard's.

- B₁: *Datte zutto totte-nai n desho?*
 But/because for a long time take(TE)-NEG NML COP-Q
 (But you haven't taken a vacation for a long time, have you?)
- A₂: Un.
 yes
 (That's right.)
- B₂: Sorenara tottara?
 then how about taking
 (Then, why don't you take it.)
 (Maynard, 1993, p. 105)

Her claims seem right at first glance, but they are not appropriate, firstly because she does not make the distinction between 'use' and 'mention',⁶ and secondly because there is no explication which B's utterance, namely B₁ or B₂, functions as [Y] in her structure.

In A₁, the speaker A says "*Sukoshi kyuuka o toroo ka naa* (I'm wondering if I should take a small vacation)" to express her hesitation and uses the utterance to imply her wish for a vacation (= I'd like to take a small vacation). In the text above, what the second speaker B intends to do by saying B₂ is the realization of the propositional content of A's wish, namely, the implicature of the utterance (= I take a small vacation). On the other hand, what B supports by saying B₁ is not the implicature just mentioned but the tacit utterance which is not expressed verbally before the utterance prefaced with *datte* in B₁ such as *Doo-shite sonna-koto iu no. Tottara* (why do you say that? Take it). Thus, contrary to Maynard's claim, what is supported by B is not what is mentioned in A₁ but is either the implicature of what is mentioned or the implied utterance preceding *datte*. In general, it should be noted that the second speaker can support either the propositional content of the first speaker's utterance or the illocutionary force of the utterance. Maynard's paper is in utter confusion in this point. In the discourse cited above, the propositional content of A₁ is the implicature since the utterance is an indirect speech act whose primary illocutionary force is to express hesitation and whose secondary illocutionary force is to express A's wish. Thus, A's hesitation, namely what is mentioned in A₁ is challenged by B, but is not supported. Consequently, this example of 'convergence' is a counterexample to Maynard's analysis.

This discussion leads me to conclude that Maynard's proposal is not general enough to analyze the case of 'convergence', and that a revision has to be made in line with the framework which provides the distinction between propositional meaning and illocutionary meaning as the theory of speech acts.

⁶ As for the distinction between 'mention' and 'use', see Searle (1969, Chapter 4).

2.2. Hasunuma's 'compromise'

In order to extend and revise Maynard (1993), Hasunuma (1995) proposes that *datte* indicates the logical connection represented by [*O* but *P* because *Q*] structure which accounts for semantic difference of *datte*, where *O*, *P*, and *Q* are defined, respectively as follows: 'the addressee's position which the speaker takes in opposition to his position', 'the speaker's position', and 'the reason/cause that justifies *P*'. She also categorizes the usage of *datte* into four types such as 'protest' type, 'challenge' type, 'supplementary explanation' type and 'compromise' type. These types except the last one are provided respectively reasonable definitions as follows: 'the speaker's protest against the hearer's challenge', 'the speaker's challenge to the hearer', and 'the speaker's justification of his own position in the context which the opposition among participants is not expressed verbally'. However, 'compromise' type is not given any appropriate characterization or is at best clumsily expressed. She defines the usage as the fusion of the second type and the third one, then adds a phrase, "at the same time the speaker gives a support to the hearer's position", which causes discrepancy in her analysis and throws the reader in confusion.⁷ For instance, as for the discourse cited in (2), she claims that "Y₁ expresses Y's position which is opposite to M's, namely *wakara-nai-nante wazawaza iu hituyou wa nai* (You need not bother to say you do not understand). Y₂ expresses Y's position to support M's position" (Hasunuma, 1995, p. 276). Thus, readers are obliged to conceive that she regards Y₂ as the utterance functioning 'supplementary explanation', namely [*Q*] of her dialogical structure mentioned above.

(2)

- M₁: *Jinkou-eisei ga tobi-hajime-ta toki ni, yappari*
 artificial-satellite NOM started-to-fly When, after all
ano rikutsu ga dousitemo wakara-nai-n-desu-yo.
 that reason NOM by-all-means understand-NEG-POL-IP.
 (When an artificial satellite started flying, after all I could not [*O*]
 understand why and how it flew by all means.)
- Y₁: *Datte, rajio wakarū?*
 But radio understand
 (But, do you know how the radio works.)
- M₂: *Zenzen wakari-mas-en, watashi.....*
 At-all understand-POL-NEG I
 (I don't understand it at all.)

⁷ Hasunuma (1995, p. 276) admits that the supplementary utterance in Y₂ is not used to justify the speaker's position, but to support the hearer's position and suggests that it has a different structure from that of 'supplementary' type. This is a self-destructive discussion to her own arguments.

in her analysis of ‘compromise’ and mistreats the utterance that functions as ‘supplementary explanation’. Put simply, this example is playing the role of a counter example to her proposal. If she adheres to the categorization of this discourse into a type of ‘compromise’, she must revise the proposal to incorporate the mechanism for the treatment of the follow-up utterance into [*O* but *P* because *Q*] structure.

2.3. *Oki’s ‘deletion’*

In line with Hasunuma (1995), Oki (1996) proposes a trichotomous representation of dialogical structure, namely [*O. P datte Q*].⁸ However, the treatments of the variables *P* and *Q* are different between them. For Hasunuma, what *Q* designates varies depending on the context. It can be the utterance following *datte* or the follow-up utterance by the same speaker.⁹ For Oki (1996), *Q* stands for the utterance following the connective, which is the same as Maynard’s. For Hasunuma, *P* is either an explicit or a tacit utterance which expresses the speaker’s position against the partner’s one. For Oki, *P* refers to a deleted utterance. Here, what is original in Oki’s analysis is her view of ‘deletion’ with which she intends to reduce all uses of *datte* into a category of ‘supplementary explanation’. She suggests that if an utterance prefaced with *datte* is not preceded by another utterance by the same speaker, the preceding utterance is considered to have been deleted. She also suggests that it can be explained that if the deleted element is supplemented with an appropriate utterance, the utterance following the connective functions as ‘explanation of reason’ (Oki, 1996, p. 101). For instance, following her proposal, the second speaker’s utterance given in the dialogue (3) is supposed to have such a deleted utterance as *Jikan-no-koto wa kinisuru-na-yo* (Don’t worry about the time) as shown in (3’).

(3)

- Bride: *Moo! Iikagen-ni shite-yo!*
 Sheeh Enough do(IMP)-EMPH
 (Sheeh! Enough already!)
I-Kyoku kimeru-noni nan jikan kakaru-no?!
 one piece choose-for how many hour take-IP
 (How many hours does it take to choose just one piece?)
- Groom: *Datte, boku-tachi-no daiji-na hirouen-da-yo.*
 But I-PL-GEN important wedding reception-COP-IP
 (But this is our once-in-a-life-time wedding reception we’re talking about.) (Hoshisato, 1996)

⁸ Oki’s representation of logical connection between utterances does not reflect the demarcation between ‘propositional level’ and ‘modal element’.

⁹ Observe the previous example in (2).

(3')

- Bride: *Moo! Iikagen-ni shite-yo!*
 Sheeh Enough do(IMP)-EMPH
 (Sheeh! Enough already!)
1-Kyoku kimeru-noni nan jikan kakaru-no?!
 one piece choose-for how many hour take-IP
 (How many hours does it take to choose just one piece?)
- Groom: *Jikan-no-koto wa kinisuru-na-yo.*
 Hour-GEN-matter TOP worry-NEG(IMP)-EMP
 (Don't worry about the time.)
Datte, boku-tachi-no daiji-na hirouen-da-yo.
 But I-PL-GEN important wedding reception-COP-IP
 (Because this is our once-in in-a-life-time wedding reception we're
 talking about.)
 (Hoshisato, 1996; the underlined part is mine.)

However, this deletion hypothesis is not sufficient, firstly because Oki uses 'deletion' without the definition of the term, secondly because it does not give us sufficient explanation about the relation between the case where the utterance preceding *datte* is verbally expressed and the case where that utterance is deleted, and thirdly because it does not say anything about why the deleted element is recoverable. When it comes to deletion, it should also be asked what the remnant of the deletion is. In the next section, the answers to these questions are presented from an illocutionary point of view.

3. Functional meanings of *datte*

In this section, the functional meaning of *datte* will be studied. In Section 3.1, *datte* will be shown not to have the lexical meaning of 'objection' in terms of the comparison with the simple oppositive connective *demo*. In Section 3.2, it will be demonstrated that utterance-initial *datte* functions as a substitute for the utterance preceding the connective then takes over the reading of 'objection' that the utterance originally has.

3.1. Interchangeability in dialogical distribution¹⁰

Given that any two expressions are interchangeable if and only if they share any dialogical contexts in which they occur, *Datte* is interchangeable with *demo*. Before going into the discussion, let us observe the discourses from (4) through (6).

¹⁰ Previous studies such as Ford and Mori (1994), Oki (1996) also discuss this matter from different perspectives.

(4)

- A₁: *Sukoshi kyuuka o toroo ka naa.*
 A little vacation ACC take(INT) Q IP
 (I'm wondering if I should take a small vacation.)
- B₁: *Datte/Demo zutto totte-nai n desho?*
 But for a long time take(TE)-NEG NML COP-Q
 (But you haven't taken a vacation for a long time, have you?)
- A₂: Un.
 yes
 (That's right.)
- B₂: Sorenara tottara?
 then how about taking
 (Then, why don't you take it.)
 (Maynard, 1993, p. 105; the underlined part is mine.)

(5)

- M₁: *Jinkou-eisei ga tobi-hajime-ta toki ni, yappari*
 artificial-satellite NOM started-to-fly When, after all
ano rikutsu ga dousitemo wakara-nai-n-desu-yo.
 that reason NOM by-all-means understand-NEG-POL-IP.
 (When an artificial satellite started flying, after all I could not
 understand why and how it flew by all means.)
- Y₁: *Datte/Demo, rajio wakaru?*
 But radio understand
 (But, do you know how the radio works.)
- M₂: *Zenzen wakari-mas-en, watashi.....*
 At-all understand-POL-NEG I
 (I don't understand it at all.)
- Y₂: *Rajio no wakara-nai hito ni jinkou-eisei wa*
muri-desu-yo.
 radio NOM understand-NEG person DAT artificial-satellite TOP
 impossible-POL-IP
 (It is not possible for a person who does not understand how the radio
 works to understand how an artificial satellite flies.)
 (cited from Hasunuma (1995, p. 276); my translation; the underlined
 part is mine.)

(6)

- Bride: *Moo! Iikagen-ni shite-yo!*
 Sheeh Enough do(IMP)-EMPH
 (Sheeh! Enough already!)
I-Kyoku kimeru-noni nan jikan kakaru-no?!
 one piece choose-for how many hour take-IP
 (How many hours does it take to choose just one piece?)

Groom: *Datte/Demo, boku-tachi-no daiji-na hirouen-da-yo.*

But I-PL-GEN important wedding reception-COP-IP
 (But this is our once-in-a-life-time wedding reception we're talking
 about.)
 (Hoshisato, 1996; the underlined part is mine.)

Here, *datte* and *demo* show the same dialogical distributions, thus to this extent, it looks as if they are interchangeable. However, these connectives show different distributions in the following cases: in what follows, three cases are examined in which the speaker performs a speech act whose illocutionary force is a directive illocutionary force of encouragement, a directive illocutionary force of discouragement, and a declarative illocutionary force of non-commitment by an explicit utterance before the utterance prefaced with *datte* or *demo*.

In (7), *datte* is preceded by an imperative utterance that has the directive illocutionary force of encouragement. There, B, the second speaker, intends to encourage A, the hearer, to make her decision regarding her future course of action which she has hesitated to take.

(7)

- A₁: *Sukoshi kyuuka o toroo ka naa.*
 A little vacation ACC take(INT) Q IP
 (I'm wondering if I should take a small vacation.)
- B₁: *Torinasai yo! Datte zutto totte-nai n desho?*
 Take(IMP) EMP because for a long time take(TE)-NEG NML COP-Q
 (Take it! Because you haven't taken a vacation for a long time, have you?)
- A₂: Un.
 yes
 (That's right.)
- B₂: *Sorenara tottara?*
 then how about taking
 (Then, why don't you take it.)
 (Maynard, 1993, p. 105; underlined part is mine.)

In (7'), however, the same utterance can not be used before the utterance prefaced with *demo*.

*(7')

- A₁: *Sukoshi kyuuka o toroo ka naa.*
 A little vacation ACC take(INT) Q IP
 (I'm wondering if I should take a small vacation.)
- B₁: *Torinasai yo! Datte zutto totte-nai n desho?*
 Take(IMP)-EMP But for a long time take(TE)-NEG NML COP-Q
 (But you haven't taken a vacation for a long time, have you?)

- A₂: Un.
yes
(That's right.)
- B₂: Sorenara tottara?
then how about taking
(Then, why don't you take it.)
(Maynard, 1993, p. 105; underlined part is mine.)

In (8), *datte* is preceded by an imperative utterance that has the directive illocutionary force of discouragement. There, B, the second speaker, intends to discourage the hearer, A, from taking her future course of action which she has been hesitant to take.

- (8) (a)
- A₁: *Sukoshi kyuuka o toroo ka naa.*
A little vacation ACC take(INT) Q IP
(I'm wondering if I should take a small vacation.)
- B₁: *Yoshinasai-yo!*
stop(IMP)-EMPH
(Stop it!)
Datte senshuu tot-ta n desho?
Because last week take-PAST NML COP-Q
(Because you took a vacation last week, didn't you?)
- A₂: Un.
yes
(That's right.)
- B₂: Sorenara yosi-tara?
then stop-how about
(Then, you should not take it.)

In (8'), however, the same utterance does not occur before the utterance prefaced with *demo*.

- *(8')
- A₁: *Sukoshi kyuuka o toroo ka naa.*
A little vacation ACC take(INT) Q IP
(I'm wondering if I should take a small vacation.)
- B₁: *Yoshinasai-yo!*
stop(IMP)-EMPH
(Stop it!)
Demo senshuu tot-ta n desho?
But last week take-PAST NML COP-Q
(But you took a vacation last week, didn't you?)

- A₂: Un.
yes
(That's right.)
- B₂: Sorenara yosi-tara?
then stop-how about
(Then, you should not take it.)

In (9), *datte* is preceded by an imperative utterance that has the declarative illocutionary force of non-commitment. There, B, the second speaker, does not intend either to encourage the hearer, A, to make, or discourage her from making her decision regarding her future course of action which she has been hesitant to take. Instead, she expresses her non-committal position to the hearer's decision making by declaring that she does not commit herself to the hearer's private matter.¹¹

- (9) (a)
- A: *Sukoshi kyuuka o toroo ka naa.*
A little vacation ACC take(INT) Q IP
(I'm wondering if I should take a small vacation.)
- B: *Sukini si-tara?*
as you like do-how about
(Do as you like. (That's your choice.))
Datte anata-jisin no koto de-sho?
Because you-yourself GEN matter COP-Q
(Because that's your matter?)

In (9'), however, the same utterance does not appear before the utterance prefaced with *demo*.

- *(9')
- A: *Sukoshi kyuuka o toroo ka naa.*
A little vacation ACC take(INT) Q IP
(I'm wondering if I should take a small vacation.)
- B: *Sukini si-tara?*
as you like do-how about
(Do as you like. (That's your choice.))
Demo anata-jisin no koto de-sho?
But you-yourself GEN matter COP-Q
(But that's your matter?)

These observations attest that *datte* and *demo* are not interchangeable and show complementary dialogical distributions.

¹¹ In this case, B presupposes that A is prepared enough to make her decision if she is verbally supported by B.

3.2. *Datte as a substitute*

In Section 3.1, it was demonstrated that *datte* and *demo* are not interchangeable and show complementary dialogical distributions. Thus, it was shown that *datte* itself does not have the lexical meaning of ‘objection’. However, it still leaves the question why the connective comes to have the meaning of ‘objection’ in the dialogical context where *datte* locates at the utterance-initial position. Then, it is essential to ask how *datte* comes to have the reading of objection and what is the role of the connective in the discourse examined in the previous section. In this section, two arguments are presented in order to demonstrate that *datte* in the utterance-initial position has the function of a substitute for the preceding utterance.

Let us show how and why the connective comes to have the meaning of ‘objection’ in the dialogical context where *datte* locates at the utterance-initial position by comparing the case when *datte* does not have the reading of ‘objection’ and the case when it does have that reading. Please compare the dialogues with/without an utterance preceding *datte*. In (10), where the preceding utterance is expressed verbally, the connective does not have the reading of ‘objection’.

(10)

Hanamura: *Doo datta?*

How COP-PAST

(How was it?)

Okido: *AA.....isshouni fus-are-ta-yo.*

Ah one laugh give-PASS-PAST-IP

(Ah, they just laughed me off.)

Hanamura: *Watashi-wa shinjiru-wa-yo.*

I-TOP believe-IP-EMPH

((I want you to know) I believe it.)

Datte Tomo-chan, tashikani mi-ta-tte itte-ta-mon.

because Tomo-TL definitely see-PAST-QUOT say(TE)-PAST-

because

(‘Cause Tomo-chan said he definitely saw him.)

(Okazaki, 1994)

Here, *datte* connects two utterances by the same speaker. One is an utterance with which the speaker, Hanamura, expresses her opinion against what is said by the partner, Okido, and the other is the one which gives a support or further explanation to her own utterance, namely, *Watashi-wa shinjiru-wa-yo* ((I want you to know)I believe it) and *Tomo-chan, tashikani mi-ta-tte itte-ta-mon* (Tomo-chan said he definitely saw him). In this case, *datte* does not have the reading of ‘objection’ even if it appears at the utterance-initial position, because the speaker expresses the objection to the partner in the preceding utterance. In contrast, in (10’), where the preceding utterance is not expressed verbally, *ipso fact*, the connective comes to have the reading of ‘objection’.

(10')

Hanamura: *Doo datta?*

How COP-PAST

(How was it?)

Okido: *AA.....issouni fus-are-ta-yo.*

Ah one laugh give-PASS-PAST-IP

(Ah, they just laughed me off.)

Hanamura: *Datte Tomo-chan, tashikani mi-ta-tte itte-ta-mon.*but Tomo-TL definitely see-PAST-QUOT say(TE)-PAST-because

(But Tomo-chan said he definitely saw him.)

(Okazaki, 1994; Hanamura's second utterance is deleted.)

This means that *datte* at the utterance-initial position can be assumed to have the oppositive meaning if and only if the statement preceding the connective is not present.

In order to further specify when *datte* has the reading of 'objection', it will be questioned if an utterance has the reading of objection when it is not prefaced with *datte*. Here, dialogues with/without the utterance-initial *datte* are compared. Unlike the utterance which is prefaced with *datte*, an utterance without utterance-initial *datte* does not have the interpretation of 'objection'. For instance, in (11), oppositive reading arises when *datte* presents at the utterance-initial position. In contrast, in (11'), oppositive reading does not arise when *datte* does not preface the utterance by the second speaker.

(11)

A: *Shiken ni ukatta?*

Exam ACC pass-PAST

(Could you pass the exam?)

B: *Datte, Benkyo shite-nai mon.*

'cause study do(TE)-NEG because

(No, I didn't.) 'Cause I didn't study.)

(11')

A: *Shiken ni ukatta?*

Exam ACC pass-PAST

(Could you pass the exam?)

B: *Benkyo shite-nai mon.*

study do(TE)-NEG because

(Since I didn't study, I didn't pass it, did I?)

This fact clearly shows that an utterance does not have the reading of 'objection' without *datte* at the utterance-initial position and strengthens the aforementioned assumption, namely, *datte* at the utterance-initial position has the oppositive meaning if and only if an utterance preceding the connective is not present. Consequently, the reading of 'objection' the utterance preceding *datte* expresses is assumed to be taken over by the connective in the dialogue where the utterance is

not expressed verbally. This is the answer to the question how and why *datte* at the utterance-initial position has the reading of 'objection'. Moreover, this assumption explains why the deleted element is recoverable. In general, a deleted element is recoverable if and only if the trace or remnant of deletion exists in the dialogical context. Here, the deleted element is recoverable because *datte* is the remnant of the deletion and functions as a substitute. Any adequate analysis of *datte* must reflect these observations.

4. *Datte* in speech act theory

In this section, it will be demonstrated how nicely three and only three types of dialogues with *datte* are treated in the framework of speech act theory. In the general theory of speech acts, elementary illocutionary acts of the form $F(P)$ are assumed to be "expressed in natural language by elementary sentences of the form $f(A)$, where f is an illocutionary force marker and A is a clause" (Vanderveken, 1990, p. 14). As has been suggested in the previous section, *datte* is assumed to represent the compound speech acts consisting of two consecutive speech acts, namely the speech act with assertive illocutionary force of 'objection',¹² and the speech act with assertive illocutionary force of 'supplementary explanation' or 'justification'.¹³ The speaker of the former presupposes that there is an immediately preceding utterance by the partner whose proposition is contradictory to what the speaker believes to be true. Given that P is the partner's proposition, the proposition of the illocutionary force of 'objection' is also P . On the contrary, what the speaker asserts to be true is the negation of the proposition. Thus, it takes the logical form of $\sim P$, which is the first proposition of the latter speech act. The other proposition of the latter is that of the utterance following *datte* of the form Q . Since $\sim P$ is connected with Q by a connective of 'supplementary explanation' or of 'because-reading', $\sim P$ holds whenever Q holds. In other words, the relation between $\sim P$ and Q can be reduced to the entailment relation between them, namely, Q entails $\sim P$. Therefore, the complex proposition of the latter speech act takes the logical form of $Q \Vdash \sim P$. In other words, these two speech acts are connected with the truth conditional conjunction and propositions in the latter speech act are connected with the truth conditional entailment. Thus, we have the logical form of $F_1(P) \& F_2(Q \Vdash \sim P)$. This dialogical representation explains what was dismissed in the previous studies including the relation between the case where the

¹² "To make an objection is to assert a proposition with the additional preparatory condition that some other proposition incompatible with it has been put forward in the context of discussion. Whenever a speaker objects that P , he disagree with someone else as regards a proposition Q that is implied by P . Moreover, he also has the perlocutionary intention of rebutting Q " (additional mode of achievement) (Vanderveken, 1990, p. 178).

¹³ To explain something is to describe something in a reasonable manner. And, "to describe something is to make an assertion or a series of assertions about it". (Vanderveken, 1990, p. 175).

utterance preceding *datte* is verbally expressed and the case where that utterance is deleted as well. Compare (12) and (15).

(12) (= 10)

Hanamura: *Doo datta?*

How COP-PAST

(How was it?)

Okido: *AA.....isshouni fus-are-ta-yo.*

Ah one laugh give-PASS-PAST-IP

(Ah, they just laughed me off.)

Hanamura: *Watashi-wa shinjiru-wa-yo.*

I-TOP believe-IP-EMPH

((I want you to know)I believe it.)

Datte Tomo-chan, tashikani mi-ta-tte itte-ta-mon.

because Tomo-TL definitely see-PAST-QUOT say(TE)-PAST-be-cause

('Cause Tomo-chan said he definitely saw him.)

(Okazaki, 1994)

In this case, the first and the second conjunct of the dialogical representation, $F_1(P)$ & $F_2(Q \Vdash \sim P)$, correspond respectively to the verbally expressed utterance, *Watashi-wa shinjiru-wa-yo* ((I want you to know)I believe it) and consecutive utterances connected with *datte*, *Watashi-wa shinjiru-wa-yo. datte Tomo-chan, tashikani mi-ta-tte itte-ta-mon* (I believe it. 'Cause Tomo-chan said he definitely saw him). The illocutionary force of the first conjunct, F_1 , is the force of the verbally expressed utterance and is the assertive illocutionary force of 'objection' whose proposition is the same as that of the second speaker's, namely, *Dare mo shinjitekure-nai* (no one believes what you said) which is implied by the second speaker's utterance, *AA.....isshouni fus-are-ta-yo* (Ah, they just laughed me off). While, the illocutionary force of the second conjunct, F_2 , which is the force of *datte* is the assertive illocutionary force of 'supplementary explanation' whose propositional content is the relation between the negation of the second speaker's proposition, namely, [There is at least one person who believes what you said] which is implied by *Watashi-wa shinjiru-wa-yo* ((I want you to know)I believe it) and proposition that supports this proposition. Therefore, this dialogue has the representation such as the followings:

(13) Dialogical Representation:

$F_1(P)$ & $F_2(Q \Vdash \sim P)$

F_1 = illocutionary force of objection

F_2 = illocutionary force of supplementary explanation

P = [No one believes what you said.]

Q = [Tomo-chan said he definitely saw him.]

Furthermore, in speech act theory, an illocutionary force is further assumed to be composed of six components such as illocutionary point, mode of achievement (of illocutionary point), preparatory condition, propositional content condition, sincerity condition and the degree of strength,¹⁴ thus can be specified in detail according to the context of discourse. In addition to these general conditions of the illocutionary force, when it comes to the illocutionary force of *datte*, special or particular conditions will be incorporated with respect to the context of discourse. For instance, what Maynard (1993) calls 'personal emotion' in Modal Contextualization will be explained as, a special mode of achievement such that both speaker and the hearer are in close human relationship, and a particular preparatory condition such that the speaker believes that the partner will accept the speaker's *amae*.¹⁵

In (12), the two illocutionary forces, F_1 and F_2 , have general and particular information as shown in (14):

(14)

- (i) F_1 : assertive illocutionary force of 'objection'
 - (a) illocutionary point: assertive illocutionary point
 - (b) a particular additional mode of achievement such that (1) both speaker and the partner are in close human relationship and (2) the speaker has the perlocutionary intention of rebutting the partner's proposition,
 - (c) preparatory condition: the speaker presupposes that the partner's belief is wrong,
 - (d) propositional content condition: the speaker believes that propositional content of her utterance is incompatible with her own belief.
 - (e) sincerity condition: the speaker is so sincere that she usually goes on to perform another consecutive speech act which supports her utterance,
 - (f) degree of strength: stronger degree of strength.
- (ii) F_2 : assertive illocutionary force of 'supplementary explanation'
 - (a) illocutionary point: assertive illocutionary point
 - (b) a special mode of achievement such that the speaker attempts to describe something by means of consecutive assertions, the latter of which is the reason for the former.
 - (c) preparatory condition: the speaker believes that what she says is true,

¹⁴ For further information, see Vanderveken (1990).

¹⁵ For details, see Maynard (1993, pp. 116–117).

- (d) propositional content condition: the propositional contents of consecutive propositions are consistent each other.
- (e) sincerity condition: the speaker is sincere so that she may persuade the partner,
- (f) degree of strength: stronger than simple explanation.

(15) (= 1)

- A₁: *Sukoshi kyuuka o toroo ka naa.*
 A little vacation ACC take Q IP
 (I'm wondering if I should take a small vacation.)
- B₁: *Datte zutto totte-nai n desho?*
 But/because for a long time take(TE)-NEG NML COP-Q
 (But you haven't taken a vacation for a long time, have you?)
- A₂: Un.
 yes
 (That's right.)
- B₂: *Sorenara tot-tara?*
 then how about taking
 (Then, why don't you take it.)

Unlike (12), the first conjunct of the dialogical representation, namely, $F_1(P)$, does not correspond to any verbally expressed utterance, because there is no such an utterance before *datte* in (15). As suggested, *datte* takes over the illocutionary force of the utterance in question. Thus, the illocutionary force of the first conjunct, F_1 , is that of *datte*, which is the illocutionary force of 'objection'. In general, such a tacit utterance that *Doo-shite sonna-koto iu no. Tottara* (why do you say that? Take it) can be the candidate for the unexpressed or suppressed utterance. Furthermore, since F_1 does not have its proposition or has a vacuous proposition, ϕ , only the force of 'objection' is highlighted. While, the illocutionary force of the second conjunct, F_2 , is the assertive illocutionary force of 'supplementary explanation', whose propositional content is the utterance which supports the illocutionary force F_1 . Therefore, this dialogue has the representation such as shown in (16):

(16) Dialogical Representation:

$F_1(\phi)$ & $F_2(Q)$

F_1 = assertive illocutionary force of objection

F_2 = assertive illocutionary force of supplementary explanation

P = [null]; tacit P = [Why do you say that? Take it.;...]

Q = [you haven't taken a vacation for a long time, have you?]

Like (14), the two illocutionary forces, F_1 and F_2 , have general and particular information as shown in (17):

(17)

- (i) F_1 : assertive illocutionary force of ‘objection’
 - (a) illocutionary point: assertive illocutionary point
 - (b) two special modes of achievement such that (1) both speaker and the partner are in close human relationship, (2) the speaker has the perlocutionary intention of rebutting the partner’s proposition, and (3) the speaker attempts to express her ‘opposite’ emotion by suppressing verbal utterance and letting *datte* take over its illocutionary force of ‘objection’,
 - (c) preparatory condition: the speaker presupposes that the partner’s belief is wrong,
 - (d) propositional content condition: null,
 - (e) sincerity condition: the speaker is so sincere that she usually goes on to perform another consecutive speech act which supports her utterance,
 - (f) degree of strength: stronger degree of strength.
- (ii) F_2 : assertive illocutionary force of ‘supplementary explanation’
 - (a) illocutionary point: assertive illocutionary point
 - (b) a special mode of achievement such that the speaker attempts to support the preceding illocutionary force,
 - (c) preparatory condition: the speaker believes that what she says is true,
 - (d) propositional content condition: the propositional contents of consecutive propositions are consistent each other.
 - (e) sincerity condition: the speaker is sincere so that she may persuade the partner,
 - (f) degree of strength: stronger than simple explanation.

Now let us analyze the case when *datte* is used with neither preceding nor following utterance, where neither P nor Q of the dialogical representation of the form $F_1(P)$ & $F_2(Q \Vdash \sim P)$ is present in the dialogue. Observe the example (18).

(18)

Manager: *Kore o todokete kureru!*
 This ACC deliver-TE give-me-favor(IMP)
 (Deliver this, please!)

OL: *EEE!*

But

(B-But!)

Manager: *EEE-ja nai!*

But-COP NEG

(No buts.)

OL: *Dattee!*

Well

(W-Well!)

Manager: *Dattee-ja nai!*

Well-COP NEG

(No wells!)

OL: *Wakari-masi-ta.*

(I) understand-POL-PAST

(A-All rights!)

OL wears a mask pretentiously as if she had hay fever.

Manager: *Warukatta. kafunsho dato wa shira-nakat-ta nda.*

Sorry hay-fever COP-COMP TOP know-NEG-PAST COP

(Sorry, I didn't know you had hay fever.)

(Akizuki, 1994; underlined Japanese sentences are mine.)

Here, both illocutionary forces F_1 and F_2 do not have the assertive illocutionary forces but have expressive illocutionary forces. They have respectively the expressive illocutionary force of protest and that of justification. It is this case that two different illocutionary forces are converged into one complex force of the form $[F_1 \ \& \ F_2](\phi)$ simply by the reduction of a vacuous proposition as shown in (19).

(19) Reduction of a vacuous proposition

$$F_1(\phi) \ \& \ F_2(\phi) \Rightarrow [F_1 \ \& \ F_2](\phi)$$

Therefore, the dialogical representation of (19) is as follows:

(20) Dialogical Representation:

$$[F_1 \ \& \ F_2](\phi)$$

$F_1 \ \& \ F_2$ = expressive illocutionary force of protest

P = [null]; tacit P = [I must say, "But";...]

Q = [null]; tacit Q = [I have hay fever.;...]

Like (14) and (17), the two illocutionary forces, F_1 and F_2 , have general and particular information as shown in (21):

- (21) F_1 & F_2 : expressive illocutionary force of 'protest'
- (a) illocutionary point: expressive illocutionary point
 - (b) two special modes of achievement such that (1) in spite of the difference in social ranks, both speaker and the partner are in close human relationship, and (2) the speaker attempts to express her 'opposite' emotion by suppressing verbal utterance and letting *datte* taking over its illocutionary force of 'protest'.
 - (c) a particular preparatory condition such that the speaker believes that the partner will accept the speaker's *amae*,
 - (d) propositional content condition: null,
 - (e) sincerity condition: the speaker is sincere so that she may persuade the partner,
 - (f) degree of strength: very strong.

Even if the number of dialogical tokens is innumerable, there are three and only three types of dialogues relevant to the connective. Thus, once these three types of dialogues are given a unified description, it could be concluded that the proposed explanation of *datte* is complete.

5. Concluding remarks

We have investigated a Japanese illocutionary connective *datte* by critically reviewing the previous studies such as Maynard (1993), Hasunuma (1995), and Oki (1996) and argued why the demarcation between propositional and non-propositional meaning of the connective is needed from the viewpoint of speech act theory.

We have demonstrated *datte* itself does not have the lexical meaning of 'opposition', instead it comes to have the contextual meaning of 'objection' at the utterance-initial position if and only if an utterance preceding the connective is not present. Consequently, the reading of 'objection' the utterance preceding *datte* expresses is taken over by the connective in the dialogue where the utterance is not expressed verbally. Our analysis could not only give the answer to the question how and why *datte* at the utterance-initial position has the reading of 'objection' but explained why the deleted element is recoverable.

The dialogical representation proposed here is general enough to explain the differences among three and only three types of dialogues with utterance-initial *datte* with/without the preceding utterance and *datte* of interjection. This ensures that speech act theory can be extended to the analysis of discourse in quite a natural way.

Last but not least, let us introduce a relevant observation in order to attract readers' attention to *datte*. In general, *datte* preceded or followed by a verbally expressed utterance is never stressed, because it usually carries old information. It is the utterance following the connective that delivers new information. In contrast, *datte* without such an utterance is put in heavy stress.¹⁶ In the theory of grammaticalization, it has been presumed that grammaticalized terms lose heavy stress (cf. Hopper and Traugott, 1993). The aforementioned case seems to be in the opposite direction, namely, an unstressed grammatical element comes to be placed in heavy stress after the reduction of the utterance it prefaced. At present, we do not argue this matter any further even if this case is a plausible counter-example to the principle of unidirectionality. However, it would be nice if the readers could sense that our present analysis will contribute not only to the standard speech act theory but to the dynamic analyses of discourse in the relevant frameworks such as the theory of grammaticalization in cognitive linguistics and the theory of information structure in functional linguistics.

Abbreviations

Acc	Accusative
Comp	Complementizer
Cop	Copula
DAT	Dative
EMP	Emphatic
GEN	Genitive
IMP	Imperative
INT	Intentional
IP	Illocutionary Particle
NEG	Negative
NOM	Nominative
NML	Nominal
PASS	Passive
PAST	Past tense
POL	Polite Form
Q	Interrogative
TE	TE-connective form
TL	Title
TOP	Topic

¹⁶ If we assume that *datte* takes over the role of focus the utterance following the connective plays, it can be explained quite naturally why *datte* comes to be a focal element and is categorized as an interjection. In syntax, an interjection is sometimes called a independent sentence as *Fire!* In other words, *datte* of this type is an independent utterance that functions as a substitute for both preceding and following utterances.

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CHAPTER 12

Contrastive Topic: A Locus of the Interface Evidence from Korean and English

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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1. Introduction

This paper addresses the issue of characterizing Contrastive Topic by examining how it is both topical and focal, as recently claimed (Krifka, 1991) and advocated with Korean data (Lee, 1996b; Choi, 1996; Wee, 1998).¹ The paper essentially attempts to show how 'contrastive' occurs and how it is distinguished from 'exclusive'/'exhaustive' in (Exclusive) Focus. I will try to show how the whole issue can be treated in the semantics/pragmatics interface and how it is further related to prosody and grammatical relations.

In Section 2, the nature of Contrastive Topic is explained: a Topic in the discourse (e.g., in a question) is divided into parts and a Contrastive Topic is about one part in contrast with the rest of the parts and the speaker has the alternative in contrast in mind. By its cancellative function, a Contrastive Topic gives rise to an implicature concerning the alternative in contrast in the polarity opposite to the given. It is marked by something like B accent in English and by a similar high tone on the (Contrastive) Topic marker morpheme in Korean. In Section 3, it is distinguished from Topic, which lacks contrastiveness, and from Focus, which is exclusively highlighted. In Section 4, it is shown how topicality is hierarchically structured syntactically/thematically and how event/proposition contrasts occur. Cancellability function in contrast is shown and why '[All]B came' is impossible in Korean and English is explained. Where and how scalar implicatures occur are explored. In Section 5, the distinction between denotational and metalinguistic levels is advocated in negation and other operators. In Section 6, the phenomenon of Contrastive Topic is viewed explicitly from the alternative semantics position and some weaknesses of the position are presented. In Section 7, it is shown how Focus is related to grammatical relations and how Contrastive Topic and some focusing morphemes are over and above them with pragmatic presupposition and implicature effects. In Section 8, the paper ends with the conclusion that different viewpoints are complementary in exploring aspects of the fundamental nature of the complex semantics/pragmatics interface phenomenon.

2. Contrastive Topic: What it is

Von Stechow (1994) proposed to treat Contrastive Topics as phrases which are both topic-marked and contain a focused item, developing L. Carlson's (1983) idea that the so-called 'topicalized' NPs in English are both old and new because there are two questions in the background. Observe:

¹ Earlier related versions of this paper were presented at the 5th International Pragmatics Conference in Mexico City in 1996 and at the discourse and pragmatics group and language and information (formal semantics) group workshops earlier in Korea. I wish to thank Vallduvi, who made comments in Mexico, and those who made comments or asked questions at various meetings. All frailties, however, are mine.

- (1) [[These]^F examples]^T I found [in Gundel].
- (2) Where did I find which example?
- (a) Where did I find these examples?
- (b) Where did I find the other examples?

Von Stechow thus assigns Topic (T) to the NP as a whole and Focus (F) to the Det in the NP, as in (1). Note that the question of (2b), which explicitly has ['the other' examples] in contrast with ['these' examples], remains unanswered or reserved. Similarly, Krifka's Contrastive Topic from subject (cited in Partee (1991) LSA lecture):

- (3) What did Bill's sisters do?
- (4) [Bill's [youngest]^F sister]^T [kissed John].

It is noted that there is a separate Nuclear Scope Focus for each sentence: [in Gundel] and [kissed John], respectively, when a Contrastive Topic occurs. However, it has not been investigated whether a typical (thematic) Topic can co-occur with a Contrastive Topic. My answer for this question is yes. This is true of individual-level predicates and matrix clauses in particular, with their Topics from subjects and Contrastive Topics in their predicate parts. If the question in (3) is: 'What did Bill's sisters do to the boys?' and the answer is (4), then 'John' in the predicate becomes contrastive in the given definite set of 'the boys'. Multiple Contrastive Topics in a sentence are likewise permissible, though rare, depending on discourse contexts in English (and in Korean as well).

Differently from von Stechow (1994), I argue that the Nuclear Scope Focus part can also be contrastive (at the same time), though not common, as will be discussed shortly. In particular, Rooth's (1996, 1992) example of an answer to the roommates-quiz question (another friend's question about how the quiz went) must be viewed from an entirely new perspective: contrastiveness. Let us consider his representations of the possible answers:

- (5) (a) Well, I [passed]^F.
- (b) Well, [I]^F passed. (cf. Well, [[I]^F]^T passed.)

Rooth argues that, in answering with (5a), the speaker suggests that he did no better than passing, wasn't an ace and that, with (5b), the speaker may implicate that my roommates did not pass. However, in the given context of the roommates known to both interlocutors, Rooth's intended interpretation of (5b) must not be represented by simply marking F. The presupposed sub-question for it may be 'How did all of you (you and your roommates) do on the quiz?' Then, the part '[I]^F' in the answer (5b), as an answer to one sub-sub-question 'How did you do?' in contrast with 'How did your roommates do?', constitutes a Contrastive Topic in

the sense that 'I' is in contrast with my roommates, as part of the Topic. Therefore, it may have to be represented by $[[I]^F]^T$ ('I' in Top is drawn back to Foc in the tree). It should be different from the answer for the question 'Who passed?', which is an information focus. Rooth's representation rather corresponds to this kind of focus but not to a Contrastive Topic. Similarly, to get the scalar implicature evoked by the first answer (5a), the speaker who asked the question is concerned with pass/fail and 'pass/fail' can become topical in a sense. Differently from nominal references, event-related contrasts are vague and more dependent on quantity scales. In English, Contrastive Topics are prosodically marked, as indicated by Roberts (1996) and it is my contention that, in Korean, they are both morphologically and prosodically marked. In the given particular roommates-quiz and similar situations, it seems that both the subject part and the predicate part, though rarely, can be Contrastive Topics.

2.1. *The meaning of contrast*

The most important point about Contrastive Topic is that the contrast set is clearly in the speaker's mind and it is formed via discourse contexts, as we can see in 'these examples' in contrast with '**the** other examples', '**which** example' in the question being possible only with a definite set of alternative examples. In (3), 'Bill's sisters' is also a definite set of alternatives and in that sense it is old information and can form a Topic but the choice of the 'youngest' among the sisters is not known, or new, to the previous speaker and thus is focused in contrast with '**the** other sisters', ending up in Contrastive Topic. However, Vallduví (1992) does not admit that such a Contrastive Topic has a Focus in it (the partitions are known to the initial speaker). But, if the preceding question were about 'Bill's youngest sister' from the beginning, there could not be anything (new or) focal from the given singleton set in the answer to the hearer. Gundel (1994) admits a contrastive kind of Focus. In (4), therefore, the speaker's answer is with reservations about the other sisters.

2.1.1. *The speaker's choice of the particular alternative in focus is selective and conditional*

This notion of 'Contrastive' is crucially distinct from 'Exhaustive' (Kuno, 1972), i.e., 'Exclusive' (my term) to be discussed later. The following Contrastive Topic example from Kasper (1992) in German translated into English by von Stechow shows the conditional nature of (Contrastive) Topic:

- (6) (a) $[[\text{Peter}]^F]^T$ would have $[\text{solved}]^F$ this problem.
 (b) If Peter had been faced with this problem, he would have solved it.

The contrast set for a Contrastive Topic is clearly in the speaker's mind and it is formed via discourse contexts, in view of the fact that '**which** example' in the

question in (2) is possible only with a DEFINITE SET of alternative examples. 'Bill's sisters' is also a definite set of alternatives, so it is old information and can form a Topic but the 'youngest' among the sisters is rather new, in a sense, to the one who asked (in the sense that he didn't know 'which one' in the given set) and thus is focused in contrast with 'the other sisters', ending up in Contrastive Topic. An answer to Krifka's example question (3) could be:

- (7) His **brothers** had a big fight.

And the contrast can be with such relevant things from outside of the given set, still constituting a Contrastive Topic, though making a detour from the asker's intention, requiring the answerer's extra mental processing of 'I don't know about his SISTERS, but if we can accommodate the category extension to his SIBLINGS, then his 'MALE' SIBLINGS = brothers...' Then, the accommodated super-question becomes 'What did Bill's **siblings** do?' Thus, it entails its subquestion 'What did his brothers do?' (every proposition answering the super-question answers the sub-question, according to Groenendijk and Stokhof, 1984). Truth-conditionally or semantically, the set of true propositions as a possible answer for question (3), does not contain 'his brothers' in the member propositions. So, (7) cannot be an answer. Indeed, it is not a straightforward but detour answer, with the forced accommodation. Accommodation is a pragmatic device. Actually, the relevant high peak in its fall-rise Contrastive Topic intonation (in accommodation) is described to be much more delayed than the other (non-accommodated) cases of Contrastive Topic. Let us turn to prosody now.

2.2. Prosodically distinct, partitive nature

Prosodically, Jackendoff's (1972) distinction of B accent from A accent must be relevant here. The B accent may be associated with a Contrastive Topic. It also corresponds to a high pitch on the Contrastive Topic marker *-NUN* in Korean. In general, A accent is for the focus part of a normal [Topic-Focus] sentence and B accent for the Contrastive Topic part of a basically [Contrastive Topic-Focus] sentence. The latter can be exemplified by (1), (4), (5), and (6a) above. For instance, (1) and (5b) can be represented as follows, if we put Pierrehumbert and Hirschberg's (1990) intonation notations in parentheses:

- (8) [[These] examples]_{B(L-H%)} I found [in Gundel]_{A(L-L%)}.
 (9) Well, [I]_{B(L-H%)} passed_{A(L-L%)}. (Well, [one roommate]_{B(L-H%)} passed_{A(L-L%)}.)

These Contrastive Topics come from the partitives of the original Topic denotations. However, in the accommodated case of Contrastive Topic such as the one in (7), the high peak in its fall-rise Contrastive Topic intonation is much more

delayed, as in $L^*+HLH\%$ (Hirschberg, 1985) than the other non-accommodated partitioned cases of Contrastive Topic, as in $L+H^*LH\%$ (Pierrehumbert, 1980) or simply $L-H\%$, as shown above. Whether to view these two divisions as two different categories or not is controversial and all the pragmatic factors involving accommodation and its consequent complex and marked mental processing in contexts must be duly appreciated, even though I tentatively treat both of them as belonging to the category of Contrastive Topic here. In this context, we must be cautious not to admit non-accommodated, irrelevant, infelicitous utterances, defying interpretations even in rich contexts. Some examples of Contrastive Topics in Korean can be shown as follows:

(10)

- (a) [ceil eorin yeotongaeng-UN]_B Joe-hako khiseu-hae-ss -eo (cf. (2)–(3))
 youngest sister CT with kiss do Past Dec
 ‘[The youngest sister]_B kissed Joe.’

- (b) [rummeit han myong -UN]_B hapkyeok-hae-ss-eo (cf. (5b))
 roommate one Cl CT passed
 ‘One roommate_B passed.’

- (11) na [khong -UN]_B meok -eoss -eo
 I beans CT eat Past Dec
 ‘I ate [the beans]_B.’

- (12) na [tongceon-UN]_B iss -eo
 I coin CT exist Dec
 ‘I have [coins]_B.’

- (13) na [cungkuk-e -NUN]_B sa-wol -e ka
 I China to CT April in go
 ‘I’m going to [China]_B in [April]_A.’

We can see a parallel between the high tone on the CT marker in Korean and the B accent in English throughout the CT examples above. In (10a), the question is about ‘Bill’s sisters’ and the answer is about a part of it, the speaker and the hearer being aware of the unanswered part. In (10b), the question is about ‘you and your roommates’ and still its super-question might be ‘How did the quiz go?’ Numerals easily become partitives. (11) has an object Contrastive Topic, answering a question about ‘the cereal’ or ‘the food’, depending on contexts. If the question is ‘Did you eat the beans?’, and the answer is ‘*khong*[beans]-UN/*khong*- na[I] *meok*[eat] -eoss[Past] -eo[Dec]’, with the object in Topic position, or ‘The beans, I ate them’, then ‘*khong*[beans]-UN/*khong*-’ and ‘The beans’ tends to become a Topic. If the

answer is (11) to the same question, a super-question must be newly accommodated and the initial speaker becomes curious about the unanswered part. In Possessor/Experiencer constructions such as (12), the Theme in the non-Topic position becomes a Contrastive Topic necessarily, if it is *NUN*-marked. The question for (12) must be ‘Do you have money?’ and because of the cancellative function of the Contrastive Topic, ‘but I don’t have bills’ is implicated. The cell of money can be divided into two sub-cells: the cell of coins and that of bills. The question was answered with a weaker version, not a stronger version committed to ‘money’ (coins + bills) as a whole, which implicates not having bills. (See below for cells.)

money	
coins	bills

This is a conversational scalar implicature. So, it can be canceled in such a way as ‘in fact I also have bills’. The question for (13) may be ‘When are you going to which place?’ = {you are going to *u* at *t*: *u* a place, *t*: a time} (cf. Roberts, 1996). If it is an answer to a question like ‘[When are you going to China]^F’, with no prior discourse, then the initial interlocutor is likely to accommodate the super-question and ask ‘Where else...?’ However, Roberts’s discussion does not make it clear which *wh*-word in the multi-*wh*-question is picked up as topical. In fact, the part answering the D-linked *which* NP must be CT-marked. Therefore, suppose the question is ‘Which month are you going where?’ Then, the answer must be as follows:

- (13′) *na* [*sa-wol -e -NUN*]_B *cungkuk -e ka*
 I April in CT China in go
 ‘I’m going to [China]_A in [April]_B.’ ‘In [April]_B I’m going to [China]_A’

The CT-marked NP ‘in April’, which is topical, must be scrambled to the front of ‘to China’, which is informationally focal, in Korean, though topicalization in English seems optional. If an information focus part corresponding to a *wh*-word in the question accompanies a CT element in an answer sentence, another affirmative CT sentence can follow by implicature or assertion. In other words, there must be pairs in parallel, CT-Focus conj. CT-Focus, such as [*sa-wol -e -NUN*]_B *cungkuk -e*, [*o-wol -e -NUN*]_B *mongol-e* ‘in April to China, in May to Mongolia’ (gapping possible) to form a continued affirmative conjunct (‘and/but...’). But without such pairs, a conjunction with two affirmative conjuncts is impossible, e.g., **na [cungkuk-e -NUN]_B ka* ‘[To China]_B I’m going’ and/but *na [Mongol-e-NUN]_B ka* ‘[to Mongolia]_B I’m going’, or *(12) followed by ‘and/but *na [ciphye-NUN]_B -iss -eo* ‘I have [bills]_B’. However, if the question is ‘Where do you have your money?’ and its answer is as follows, then it is all right: *tongceon-UN cumeoni-e iss-eo* ‘The coins are in the pocket’, *haciman ciphye-NUN cigap-e iss-eo* ‘but the

bills are in the wallet'. Here, the information focus parts must be distinct from each other in different conjuncts.

The totality of the whole set involved is in the Topic of the relevant superquestion and in the mind of the person who answers the question. Therefore, the given partial answer plus the continued complementary negative assertion/implicature constitutes a totality. Multiple affirmative CT sentences are possible if there are multiple CT-Focus pairs, as we have seen.

The A contour was also exemplified by a universal negation (\forall -) sentence and the B accent also by a partial negation ($\neg\forall$) sentence in English. Contrastive Topic, I would argue, has unique context-dependent and interactive prosodic features cross-linguistically and, for the latter partial negation sentence with the B accent, Korean analogously shows high tone on the Contrastive Topic marker, as in (14):

- (14) haksæng -tul -i modu-NUN o-ci anh -ass -ta
 student Pl Nom all CT come not Past Dec
 'Not all students came.'

- (15) haksæng -tul -i modu o-ci anh -ass -ta
 student Pl Nom all come not Past Dec
 'All students didn't come.' [ambiguously]

The Contrastive Topic marker can be attached to the universal quantifier directly as in (14), with a high tone on the marker (or the marker can be attached to the Verb-Comp 'o-ci' instead to get the same partial negation). Here, scope/negation reversal necessarily occurs. Contrastive Topics, ensured by morphology and prosody in Korean and by prosody in English, may affect the Logical Form of a sentence. Even in (15), a similar high tone occurs on the Comp '-ci' right after the Verb where the Contrastive Topic marker can be attached. Here, the negated 'all' (some) can have the rest of 'all' (i.e., \neg 'all' can be 'many', 'some', etc.) in contrast in partition and thus can get a Contrastive Topic marker.

Without the marker, the negative sentence, such as (15), can be 'ambiguous'. But the partial negation (negation wide scope) reading, corresponding to the reading of (14) involving the Contrastive Topic marker, retains the prosodic features of (14) (*motu* 'all' closer to the following negation in pronunciation and a high pitch on the Comp '-ci' after the Verb). The universal negation reading lacks these B-contoured prosodic features, *motu* 'all' being closer to the subject noun in pronunciation. On the other hand, if we say 'All -NUN came' affirmatively in Korean, it is unacceptable (Lee, 1989, 1992) because there cannot be any contrast made by partition in the whole set.² Other quantifying Determiners do not have this

² However, if the sentence is followed by a cancellative/contrastive clause like 'but no one volunteered', then its acceptability improves sharply. See the section on *Event Contrast*.

problem in forming a Contrastive Topic. For example, ‘Half-NUN came’ is OK and naturally the other half in contrast didn’t come, by implicature. Therefore, all the quantifying Determiners including numerals and fractions coming from grammatical subject tend to form a Contrastive Topic easily, with some constraints on the universal Determiner. Similar constraints involving the universal quantifier in English have been recently found by Buring (1994).

From the above, we can say Contrastive Topic (CT henceforth, when used as a modifier) has its own unique, pragmatically significant prosodic features both in English and Korean.

3. How distinct from Topic and Focus?

3.1. How distinct from Topic

A typical (thematic) Topic shows zero or little contrastiveness and no high pitch or stress, though its marker is not distinct from the CT marker (‘-(N)UN’) in Korean and in Japanese (‘-wa’), with a slight pause after it. It often comes from a subject but can come from an object or other non-subject elements, as in (17) below. A Topic is typically presupposed, familiar, or at least anchored. Generic statements are typical Topic constructions (Lee, 1996a). Consider:

- (16) [mul -UN]^T thumyongha -ta [generic]
 water Top transparent Dec
 ‘Water is transparent.’

- (17) [inshaeki -NUN]^T hankuk saram -i palmyonghae-ss-ta [kind-object predicate]
 printer Top Korean person Nom invented
 ‘The printer, a Korean invented it.’

When there is a salient discourse Topic or its candidate (indefinite) previously established, its anaphoric NP can become a sentential Topic, continuing as a discourse Topic until discourse Topics are changed. There does not occur any partitioning or accommodation of the antecedent denotation, unlike in Contrastive Topic. Topics in Korean must be at the head of an S as SPEC-CP, with the Topic marker. The marker may be null and the whole Topic NP can be a zero pronominal. Then, the rest of the S/discourse talks *about* the Topic. Observe:

- (18) (a) [Mary -NUN]_i yocium muot ha -ni?
 Top nowadays what do Q
 ‘What does Mary do these days?’

- (b) [ku chinku -NUN]T_i taehakwon -e tani -eo
 that friend Top graduate school to attend
 'That friend goes to graduate school.'

In spoken Korean, the Topic marker *-NUN* in (18b) can easily delete, not affecting the Topichood of the remaining nominal. Those typical Topics shown above can change to Contrastive Topics in contexts where some explicit items in contrast with the NP denotation are given and are in the speaker's mind. Contrastive Topics, on the other hand, can also occur in the middle of an S rather freely. Elements with a CT marker that appear in different conjuncts, either at the head or not, in juxtaposition, are Contrastive Topics, and if they are from subjects, predicates must be distinct from each other. The *NUN*-marked elements in the middle of an S are Contrastive Topics but not Topics, if they are not Topics embedded in matrix communication verbs (Lee, 1973). A Topic operator has been suggested, in line with DRT (Lee, 1996a).

In English, on the other hand, the device of fronting/dislocation/intonation is employed because there is no marker for Topic or Contrastive Topic. The so-called 'topicalization' as in (1) typically creates a Contrastive Topic rather than a Topic (cf. Gundel, 1974). Rather, the operation of left-dislocation, leaving a residual pronoun behind, creates a Topic in English. The 'As for . . .' construction (e.g., 'As for the children, they went to school') seems a subtype of dislocation but seems to be often employed as a Contrastive Topic with B accent. Therefore, 'topicalization' can be said to be a misnomer by Chomsky. A right-dislocated element in English such as the following is also topical. It is unaccented (Lambrecht, 1994). Observe:

- (19) She is a real ANGEL, your sister.

So far, we have tried to see clearly the distinction between Topic and Contrastive Topic, both in Korean and in English. Topics are unaccented and share other common features in both languages. Therefore, Roberts' (1996) pessimism about the theoretical status of Topic in information structure is not tenable.

3.2. *Distinction from Focus*

In English, a default Focus falls on the last element or NP of an S in a Topic-Focus construction. In Korean, a head-final language, a default Focus falls on the pre-verbal position (cf. Kim, 1985), much like in Hungarian. Otherwise, some 'marked'/ uneconomical stress (Reinhart, 1995) or focus construction like 'It is MARY who . . .' must be used.

A genuine Focus, I would argue, has no notion of contrast except that of 'alternatives' (Rooth, 1996). The focused element alone is highlighted and other alternatives are simply shadowed and ignored or excluded at the moment of utterance,

- (22) (a) Mary-NUN coffee -man masi-oss-ta
 Top only drank
 'Mary only drank coffee.'
 (b) Mary only drank coffee.'
- (23) (a) Mary-NUN coffee -to masi-oss-ta
 Top also drank
 'Mary also drank coffee.'
 Mary also drank coffee.'

All these focalizers in Korean are attached to the focused element normally but clausal scope ones which must be attached to the verbal part often float to the nominal part (*pom[spring]-man[only] o[come]-myon[if] sae-ka u-n-ta* 'If only spring comes, birds sing', *pom[spring]-to[also] w-ass-uni untongha-ca* 'Since it is also the case that spring has come, let's take exercise'). Scope interactions among multiple focalizers (and negation) arise in a sentence. The focalizers *-man* 'only' and *-to* 'also' can be in a dual relation and they are intricately related with the CT marker *-NUN* semantically and pragmatically.

The term 'Contrastive Focus' is used in a confused way. Lambrecht (1994) refers to an 'old' (active) referent carrying a focus accent as a 'Contrastive Focus'. Thus, the following examples (24a, 25) are given:

- (24) (a) Pago [io]^F.
 (b) [nae-ka]^F. nae-l-kke.
 I Nom pay will
 'I'll pay.'
- (25) (a) Among John, Mary, and Tom, who is the oldest? [Tom]^F is the oldest. – Kuno
 (b) Who baked the cake, you or your mother? – [I]^F did. – Lambrecht
 (c) After the roommate's utterance 'you-wa[CT] do cleaning, I-wa[CT] do cooking,'
 I -ga do cooking, so you-wa[CT] do cleaning.' – modified from Kuno

Those focused pronouns or nominals are said to have a limited number of alternatives in the context. This corresponds to what Kuno (1972) calls 'exhaustive-listing *ga*' and what I call Exclusive Focus (narrow focus). Exclusive Focus applies not only to the nominative case as in Kuno but also to any other cases. But there is no clear distinction between a specified and non-specified number of alternatives. There is no clear sense of contrast involved

comparable to contrast in Contrastive Topic. If asked ‘Who made the hamburgers?’ the focused part in the answer can have either a specified or non-specified number of alternatives depending on the context. It is my basic contention that (Exclusive) Focus highlights a particular element from among the (evoked) members of the alternative set, shadowing other members at the moment of utterance. If a generic NP in a generic statement is focused, its Nom(inative) marker is revived and specially stressed, e.g., from (16): [*mul -i*]^F *thumyongha -ta* ‘It is water that is transparent’. The sentence sounds echoic from the previous context as a denial or can be an answer to the question ‘What is transparent?’ and we are not sure whether its alternatives are limited or not.

We usually consider Focus and Topic at the sentential level, even though Topic came to be understood to be connected to a previous question or discourse. People have not discussed a discourse Focus so far. If all past sentences go into the context or presupposed propositions, then is the Focus in the last sentence the only Focus, as implied in Stalnaker (1974)? Or, more practically, what would be the most important, highlighted and conclusive Focus or set of coherent Focuses, as a newly asserted part? If we can set up a schema of extracting this, which sounds tougher than extracting a discourse Topic, then some automatic Topic and Focus extractor for an extended text will be possible (cf. Hajičová, Sgall and Skoumalova, 1995).

4. Topicality hierarchy and event/proposition contrast

4.1. Topicality hierarchy

The topicality hierarchy roughly corresponds to the NP accessibility (or a modified Thematic) hierarchy (Keenan and Comrie, 1974), interwoven with word order. Generics are most topical, and Agent, Experiencer, and Theme, domain-restricted by a (presupposed) question, are next topical and spatio-temporal Location is less topical, when they are in Topic position. They easily form a Topic, with no contrast. Even in one S a CT-marked element closer to the V in the Nuclear Scope is more contrastive/focal than topical. Thus, in (11), if we insert a (quantity) modifier like *manhi* ‘a lot’ just before the verb, it is OK, but if it precedes the Contrastive Topic *khong-UN* ‘beans-CT’, then it becomes ungrammatical; the Contrastive Topic is that much topical and the specific information provided by the modifier is that much focal. Likewise, a CT-marked verb, too contrastive/focal, cannot become a Topic. Only strong NPs are ‘scrambled’ (de Hoop, 1992). The more topical, the more strong. An element both indefinite and nonspecific cannot be a Topic. Indefinite Topics have anchoring/specificizing modifiers. Indefinite and specific Contrastive Topics abound in English (the parenthesized sentence of (9)) and Korean ((10b)).

4.2. Event/proposition contrast

Even verbs and adjectives in Korean can get a CT interpretation by nominalizing them and attaching the CT marker to those nominalized predicates (necessitating something like DO-support for verbal inflection as a consequence). Observe:

- (26) Sue -ka Mary -rul mil -ki -NUN hae -ss -ta
 Nom Acc push Nominalizer CT do Past Dec
 'Sue pushed Mary, but... (she didn't hit her or fell her to the ground).'

A Contrastive Topic applied to a verb/adjective is **event-contrastive**, implicating the denial of an event/state higher or stronger than the given event/state in contrast on the triggered **scale** relevant in the discourse context. Similar effects occur in English, with B accent in predicates or VP preposing constructions (Ward, 1985). It is so focal that it cannot be scrambled to a VP-external position in Korean. In other words, it cannot become a typical Topic, as mentioned. A preposed VP in English cannot become one, either (analogous to a nominalized CT VP in Korean, or simple emphasis). In a sentence, a CT-marked element closer to the verb in the Nuclear Scope is more contrastive/focal than topical. In the case of event-contrast, scalar implicature is unmistakably guaranteed and its subject and object remain identical in the implicated or following sentence. If the following clause or implicature has a different subject and predicate, the *-NUN*-marked sentence is **proposition-contrastive**.³

If the CT marker *-NUN* is attached to a manner adverb, then it also becomes **event-contrastive**, and its sentence is interpreted in the same way as the sentence in which it is attached to the verb. Observe:

- (27) Sue -ka Mary -rul seke-NUN mil -eoss-ta
 Nom Acc hard CT push Past Dec
 'Sue pushed Mary hard, but... (she didn't fell her to the ground).'
- (28) Sue -ka Mary -rul seke mil -ki -NUN hae -ss -ta
 Nom Acc hard push Nominalizer CT do Past Dec
 'Sue pushed Mary hard, but... (she didn't fell her to the ground).'

Both sentences have scalar implicatures in the same way. A stronger event than 'push hard' on the scale, e.g., 'fell (to the ground)' is negated in conversational implicature. If the stronger had been intended, it could have been uttered because of the quantity maxim. The CT scope in this case is up to the adverb. However, if its scope remains in the verb constituent 'push', then only the stronger alternatives such as 'hit' can be negated in implicature, meaning 'but didn't hit her hard'. So,

³ See Lee (1973), which discussed the unuttered clause that shows conditionality, reservation, etc. This is for event/proposition-contrast possibilities.

the adverbial modification remains unaffected in the latter case. Though rarely, a scale can apply to the degree of manner, etc. of the modification only, not affecting the verb. Because of the scope behavior of the CT marker, the CT-marked adverbial modifier *seke-NUN* can hardly scramble over the object 'Mary-rul (Acc)' in (27), but with out the CT marker, the adverb *seke* can scramble over it. This effect may be obtained by some inversion in English. Examples of event/proposition contrast in English include a sentence in which a focal (emphatic) auxiliary appears such as: 'We DID receive your fax, but unfortunately it didn't come out right'. Aspects and modals also can get CT-marking: [Aspect] *tali-ko-NUN iss-ta* '(He) is running', (but I am not sure whether he can *finish* the race)(Progressive and perfective (*finish*) are on the same scale); [Modal] *ka-to toe-ki-NUN ha-ciman kkok ka-ya ha-na?* 'I may go, but must I go?' (Permission and obligation (deontic) modals are on a scale); [Tense] *cal ha-ki-NUN hae-ss-ciman/??cal hae-ss-ki-NUN ha-ciman aphuro-ka muce-i-ya* '(You) DID well but the future is a problem' (not easy to get a tense contrast in Korean... rather time adverbial is contrasted: *ceon-e* 'before' -NUN *cal hae-ss-ciman*... '...did well BEFORE but...').

If an instrumental has the CT marker, then scalar contrasts in instrumental nominal, i.e., individual contrasts, occur (e.g., *mae-ro-NUN* 'with a rod-CT' → 'not with a (stronger) club/iron bar/...'. Here, the instrumental oblique case marker *-ro* is obligatory, followed by the CT marker *-NUN*. Note, on the other hand, that an instrumental NP (without the instrumental marker) cannot form a typical (thematic) Topic, e.g., consider the following contrast:

- (29) (a) appa -ka Mary -rul mae-ro -NUN ttaeri -eoss -ta
 daddy Nom Acc rod with CT beat Past Dec
- (b) *mae-NUN appa -ka Mary-rul ttaeri -eoss -ta
 rod Top daddy Nom Acc beat Past Dec
 'This rod Daddy beat Mary.' [intended]

If the polarity of the assertion is negative in (26) (being '*...mil-ci-NUN anh-ass-ta* '...didn't push-CT...'), then some polarity-reversed implicature of weaker alternative events such as 'but touched her', etc. occurs, if the CT scope is the verb itself, maintaining the same theme in the events. However, if the negative CT effect is associated with the focused object, then the object constituent is negated, with some other alternative in contrast being affirmatively implicated. Its consequence, then, is that it becomes equivalent to the negative object-CT sentence. Further, if the negative CT effect is associated with the subject, then the subject constituent is negated, with some other alternative in contrast affirmatively implicated. Floated CT markers, however, have different effects, as will be shown readily.

In (32), the CT marker is attached to the verb ‘come’, and the sentence has the same interpretation as (31), in which the marker is attached to the subject. As in (32), if the CT marker is attached to the verb or any non-subject element, the subject tends to get the neutralized subject marker, rather than the *-NUN* marker. The cancellative function of the marker on the verb takes its scope over the whole proposition and some other proposition comes after the contrastive conjunction marker *-ciman* ‘but’. Let us consider further examples, as follows:

- (33) Yeonghi -NUN o -ass -ciman panki -l saram -i eops-eo
 CT come Past but welcome to person Nom not exist
 'Yeonghi came but there is no one to welcome him.'
- (34) pom -UN o -ass -ciman IMF hanpha -ro chup-ta
 spring CT come Past but cold wave due to cold
 'Even if spring is here, it is cold due to the IMF cold wave.'

In (33) or (34), the expectation associated with the first proposition is cancelled by the second proposition. Both examples form proposition-contrasts and show CT marker floating to the subjects from the verbs; each example has distinct clauses in the contrastive conjunction. Suppose the second conjunct also has the -NUN-marked subject in (33) and (34), then the new sentences will be individual-contrastive, not event/proposition-contrastive. Further, suppose both examples only have the first conjunct, like 'Yeonghi-CT came' and 'Spring-CT came', then the agentive 'Yeonghi-CT' tends to constitute an individual-contrast, whereas the unaccusative (weather/season-related) VP-internal subject 'Spring-CT' tends to constitute an event(/proposition)-contrast, not an individual-contrast. The subject and the verb together form an event VP and they are hardly separable in the latter case. When floating occurs and the subject gets CT-marked, then its topicality increases and the event(/proposition)-contrast becomes more emphatic. If a whole clause is assigned Focus or CT/Topic, its effect gets diluted. Floating is for a stronger effect. In an event-contrastive, transitive sentence, the CT marker may move to its object, as follows:

- (35) Joe-ka tol -UN cha -ass -ciman pal -UN tachi-ci anh -ass -ta
 Nom stone CT kick Past but foot CT hurt not Past Dec
 'Joe kicked the rock-CT but didn't hurt his foot-CT.'

In (35), floating occurred in both conjuncts from each verb (...*cha-ki-NUN hae-ss-ciman*...*tachi-ci-NUN anh-ass-ta*) to its object. Therefore, an object-CT sentence is ambiguous between individual-contrast and event-contrast readings. In the individual-contrast reading, the following or implicated clause must have the same verb. As already shown in (27) and (28) above, the CT marker on the verb in (28) floats to its manner adverb in (27). English also seems to show the phenomenon of CT B accent floating. Consider:

- (36) ?*[[All]^B (of the students)]^T came.
 (37) [[All]^B (of the students)]^T came but no one volunteered.

The CT B accent, though not easy, falls on the subject part in (37), where a proposition-contrast actually occurs. The same accent cannot fall on the subject of (36), an affirmative sentence, where a contrastive clause does not follow. 'All'

cannot have any parts in contrast and cannot constitute a Contrastive Topic, as discussed earlier with a Korean example. In English, as an SVO language, the CT B accent should fall on the object, rather than on the verb (see the translation of (35)).

5. Denotational vs. metalinguistic contrasts

Contrasts treated so far are denotational, not metalinguistic. Therefore, a denotational equivalent to a Topic or another constituent in an answer sentence cannot take a CT accent. Suppose I forgot whether the other party has only son or only daughter and asked him, "How is your daughter doing?" My friend's answer with the corrected Topic, if the friend is cooperative enough, cannot take the CT B accent: *"[My son]^B is doing fine" or *"[*nae* 'my' *atul* 'son' -UN]CT *cal ha-ko iss eo* 'is doing fine' ". It cannot be a Contrastive Topic; partitioning or contrast cannot occur. Only some correction lengthening can occur. In general, change in expressions can freely occur as far as their denotational or even functional values are the same. The changed expression cannot take a CT marking in this case. On the other hand, metalinguistic contrasts by negation (Horn, 1985) (and other logical operators such as conditional, disjunction and conjunction) are a little different. Consider:

- (38) (a) We didn't see the hippopotamuses.
 (b) We saw the hippopotami. (not *P*; *P*)
- (39) (a) She's not happy; she's ecstatic.
 (b) kunyeo -nun haengpokha-n keos-i ani-ra hwangholhae
 she Top happy Comp-Nom Neg Cnj ecstatic
 'It is not the case that she is happy but she is ecstatic.'
 (c) (?)kunyeo -nun haengpokha-ci anh -ko hwangholhae
 she Top happy Neg Cnj ecstatic
 'She is not happy but she is ecstatic.'

In (38), (a) and (b) constitute a contradiction extensionally but they are all right metalinguistically. If the negated utterance (a) is followed by an utterance like 'We saw rhinoceroses' (not *P*; *Q*), we get a denotational or descriptive reading, with no contradiction felt. That is why Horn (1985) argues for ambiguity: negation as the ordinary truth-functional operator and negation for the marked, extended metalinguistic use of the operator. The latter is pragmatically derived for Horn. Carston and Noh (1996), on the other hand, regard negation, including metalinguistic, as unambiguously truth-functional. They and van der Sandt (1991) are against Horn's

alleged semantic ambiguity thesis. However, we cannot avoid some word-game-like fun or a slight sense of betrayal in standard cases of metalinguistic negation; negation has been applied at a different level from a denotational level. If we introduce a communication verb as in 'Mary *says* [hippopotamuses] and John *says* [hippopotami]', the linguistic forms themselves become denotational objects in the conjuncts and the conjunction is applied truth-functionally at the usually expected denotational level. As soon as we change the verbs to *saw* in the same sentence, however, what they saw may be identical in a bizarre way, if the objects of the verbs are not used as mention (e.g., as the letters of the words) at a different level. The conjunction operator must take both conjuncts at the same descriptive level or at the same non-descriptive, metarepresentational (metalinguistic/mention) level consistently. It cannot take one conjunct descriptively and the other non-descriptively at a mixed level. This level consistency principle also applies to other logical operators such as negation and disjunction. In the case of metalinguistic negation, both of the contrast pair propositions involve linguistic forms but not their denotational or descriptive contents. In this sense, it is distinct from Contrastive Topic, which has to do with denotational values.⁴

To see the distinction between metalinguistic negation and (negative) Contrastive Topic clearly, consider the following impossibility of *-NUN* attachment to the metalinguistic item in (40). Consider further the contrast between the denotational scalar implicature or its expression in the (negative) Contrastive Topic example (41) and the impossibility of like implicature or expression in the non-topical (focal) example (42).

- (40) ?*kunyeo -nun haengpokha-ci-NUN anh -ko hwangholhae
 she Top happy CT Neg Cnj ecstatic
 'She is not happy-CT but she is ecstatic.'

- (41) (a) Mary-nun namca -rul se myeong -UN cha -ci anh -ass -eo
 Top man Acc 3 Cl CT kick not Past Dec
 'Mary didn't kick three men-CT.'
- (b) tu myeong -ul / *ne myeong -ul cha -ass -eo
 2 Cl Acc 4 Cl Acc kick Past Dec
 '(She) kicked two/*four.'

- (42) (a) Mary-nun namca -rul se myeong -ul cha -ci anh -ass -eo
 Top man Acc 3 Cl Acc kick not Past Dec
 'Mary didn't kick three men-CT.'

⁴ McCawley's (1991) *contrastive negation* structure, 'not X (but) Y,' is rather syntactic and the contrast involved can be either topical or focal denotationally and can also lend itself to metalinguistic uses.

- (b) tu myeong -ul / ne myeong -ul cha -ass -eo
 2 Cl Acc 4 Cl Acc kick Past Dec
 '(She) kicked two/four.'

In (42b), '(She) kicked four' is possible because (42a) can have the 'exactly/precisely' reading, which (41a) cannot have.

The relevance-theoretic approach also acknowledges the role pragmatics plays in interpreting the metalinguistic or echoic use of negation: the negation operator is logical or (truth-conditional) semantic and the metalinguistic use is pragmatically inferred from context. However, if this approach purports to take an underspecification or underdeterminacy thesis, as it proclaims, which sounds attractive, its *truth* in 'truth-conditional' must be dissociated from *denotational*, which seems a bizarre situation.

6. Alternatives

Rooth (1996) makes use of alternative semantics for focus. Focus introduces a set of alternatives with a variable x , but does not necessarily involve existential presupposition. He distinguishes intonational focus from a cleft in this respect. The latter has existential presupposition, not the former. Consider Akmajian's (1973) examples and their corresponding ones in Korean:

- (43) MITCHELL urged Nixon to appoint Carswell.
 (44) It is MITCHELL who urged Nixon to appoint Carswell.
 (45) [x urged Nixon to appoint Carswell]. [x = Mitchell]
 (46) MITCHELL-i[Nom].../*Mitchell -UN[Top]... (in the intended sense)
 (47) [Nixon -eke... chokku -han kos -UN]T MITCHELL -i -ta
 Dative urged Comp Top is Dec
 'It is MITCHELL who urged -'.

Both the intonational focus sentence of (43) and the cleft sentence in (44) have an almost identical background like the open proposition in (39). Rooth, however, argues that an intonational focus sentence like (43) lacks existential presupposition 'someone urged...', as evidenced when it is an answer to a yes-no question like 'Did anyone urge Nixon to appoint Carswell?' An alternative proposition of the form in (45) does not have this presupposition, whereas (44) has. It must be noted that the corresponding intonational focus NP in Korean shows a nominative marker, not a Topic marker, as in (46), and the presupposed part of the cleft in (44) corresponds to a Topic clause missing its subject in it, in (47). Rooth argues that

intonational focus in English has a weak semantics of evoking alternatives, differently from a cleft, which has strengthened semantics of existential presupposition and ‘exhaustive listing’. What I want to make sure at this point is that the notion of ‘(evoking) alternatives’ is distinct from that of ‘contrast’ we have treated.

The alternative semantics approach to focus is also based on the theory of question–answer dialogue game. If we ask a question, it can be continued or answered in a restricted range of possibilities, a set of sentences, which Buring (1994) calls a ‘topic’ or T, our ‘super-Topic’, since we have a super-question. This is distinct from our typical (thematic) exhaustive sentential Topic and non-exhaustive sentence-internal Contrastive Topic. They are all topical in some common respect. The focus value of a sentence is derived from it as $[[\text{Mary drank [coffee]}^F]]^f$ = the set of propositions of the form “Mary drank y”, or as $[[[\text{Mary}]^F \text{ drank coffee}]]^f$ = the set of propositions of the form “x drank coffee”. The ordinary semantic value of a sentence, on the other hand, is $[[\text{Mary drank [coffee]}^F]]^o$ = the proposition “Mary drank coffee”. The alternative set, in a question–answer congruence, is ultimately determined by the semantics and/or pragmatics of questions, as Rooth admits. Focus is regarded to evoke this set in a presuppositional way. Let us consider how Buring tries to get an appropriate question–answer congruence incorporating the topic semantic value of a sentence. A set of propositions $[[s]]^f$ can be transformed into a proposition by *trivialization*, i.e., forming its union $\cup[[s]]^f$. In the same token, the topic semantic value of a sentence can be represented as $[[s]]^t$ by sticking in the alternatives to our CT in the s [the woman]^{CT} wore [a suit]^F, for instance: ‘the man wore [a suit]^F’, and ‘the woman wore [a suit]^F’ for an answer to the question ‘What did the couple wear?’ Assuming that there are only two elements in $[[a \text{ suit}]]^f$, i.e., a suit and a dress, we can get the following set of propositions:

- (48) {the man wore a suit, the woman wore a dress, the man wore a dress, the woman wore a suit}

Then, we have both CT and focus alternatives here as $[[\text{What did the couple wear?}]]$. We can have a similar set for $[[\text{Where did I find which examples?}]]$ for (1) at the head of the paper. Buring, then, gives the following equation and the appropriate answer condition for an exhaustive answer:

- (49) A sentence s can appropriately be uttered given a super-Topic T iff

- (a) $\cup[[s]]^{tf} = \cup T$ and
- (b) $\cup[[s]]^o$ is an appropriate ‘answer’ to $[[s]]^f$.

A Contrastive Topic serves to narrow down the (super-)Topic originated by the original (super)question so that an exhaustive answer can be provided. Given a question–answer sequence [q] [a], the residual topic (CT) consists of those propositions which are in $[[q]]$ but not in $[[a]]^f$. The latter is instantiated by $\{[\text{the}$

man]^{CT} wore a suit, [the man]^{CT} wore a dress}, and [[s]]^o by the ordinary semantic value of '[the woman]^{CT} wore [a suit]^F'. Therefore, uttering a CT sentence like this amounts to asserting that only the propositions in [[s = a]]^o out of [[s = a]]^f is true, and the CT sentence is expected to be continued with some residual topic (CT), which can be found in [[42]] = [[q]]. The CT-marked sentence '[the woman]^{CT} wore [a suit]^F' is identical with its non-CT-marked counterpart sentence in truth conditions, but it leads to a totally different state of discourse. This is exactly where the semantics-pragmatics interface arises. If the denotational value of the intended super-Topic in the super-question is identical with that of the Topic in the answer, then the Topic is not contrastive but is exhaustive from the beginning.

This alternatives approach makes our previous treatment of Contrastive Topic somewhat more explicit set-theoretically, but leaves quite a lot unexplained: the rise of implicature (to be continued with), accommodation of what the super-question did not quite intend, and presuppositional subtleties related to the distinctions between 'the couple' and the combination of 'the man' and 'the woman', between 'both' and 'the two', etc. In particular, no clear distinction is made in this approach between 'what' and the D-linked 'which' in the super-question of question-answer sequence, in establishing related sets. Relevant sets are crucially dependent on the interactional meanings of linguistic expressions and contexts, contexts including the speaker's cognitive states.

7. How to do with grammatical relations

To be highlighted as a Focus, a nominal expression must maintain its structural or oblique case marker on it. This was evidenced by (21), in which each focused nominal corresponding to its *wh*-word in (20) has its own case, nominative, accusative, or oblique. The Exclusive Focus in (43), where the subject variable is substituted by a constant as in (45), is Nom-marked as in (46) and the presuppositional part [Restrictor] in (44) gets Top-marked in Korean as in (47). Nom and Acc case markers are mutually exclusive with the Top/CT marker in Korean, although the Top/CT marker can occur with oblique cases. Consider:

- (50) [nuku -ka/*-NUN]^F Mary -rul mil -eoss -ni?
 who Nom Top Acc push Past Q
 'Who pushed Mary?'

- (51) [Sue -ka]^F but *[Sue -NUN]
 Nom Top
 'Sue.'

However, in stressed (Exclusive) Focus environments as well as neutral, default environments such as embedded clauses, structural and oblique case markers show up. Top/CT expressions as well as focusing delimiters (focalizers) in general are heavily presupposition/implicature-bound, whereas neutral and natural case-marked elements, whether focused or not, are free from such effects.

Consider the rough Korean counterparts of a sign in the London underground '*Dogs Must Be Carried*', initially discussed by Halliday (1970) and analyzed by Partee (1991):

- (50) kae -rul an -ko tureo -ka -shi -o
 dog Acc embrace and enter go Hon Imp
 'Please enter with dogs embraced.'
 IMP (here (e), embrace dogs and enter at e) [modified from Partee (1991)]
- (51) kae -NUN an -ko tureo -ka -shi -o
 Top/CT
 'Dogs, enter with them embraced.'
 MUST/IMP (dog (x) & here (x), embrace x and enter) [cf. Partee (1991)]

Note that the 'dog' is Acc-marked in (50). Then, we may have to be worried. In (51), the dog is topical, thus conditional and we don't have to be worried. In English, the active version 'You must carry DOGS' may be similar to (50), with the normal grammatical relation of object in its position. Passivization is a device of topicalization in this case in English and the topicalized passive subject reading is a common reading, since CARRY is focused. This is different from 'Shoes must be worn', where SHOES must be focused.

All the elements in an ordinary sentence may have a set of alternatives, in its weaker sense, in their choices in paradigmatic relations, e.g., observe the Korean sentences:

- (52) pi-ka[Nom] o-n -ta
 'Rain is coming = it's raining'
- (53) pi-NUN[CT] o-n-ta
 'Rain-CT is coming.'

Sentence (52) as a whole is an information unit, in Nuclear Scope or VP; even if the Nom is replaced by a top marker, it is a Contrastive Topic, not a Topic, in contrast with 'snow', or other events. A Contrastive Topic in the Restrictor part of the tripartite semantic structure may interact with some focal element, resulting

in: $[[F]]^T$ (e.g., (8)); a Contrastive Topic in Nuclear Scope: $[[T]]^F$ (e.g., (53)). The former arises in the Topic zone and the latter in the Focus zone.

We can now make a tentative generalization such that the ordinary truth-conditional semantic value or focus semantic value of a proposition is based on structural and inherent grammatical relations, whereas contrastive topicality gives rise to presupposition/implicature effects over and above grammatical relations.

8. Conclusion

We have tried to see the semantics/pragmatics interface with regard to the phenomenon of Contrastive Topic in Korean and English. We could explore some aspects of the fundamental nature of the phenomenon by means of different theoretical viewpoints such as game theory of dialogues, discourse representation theory, alternative semantics, relevance theory, prosodic theory, and so on. We cannot but admit that different theories are in need for different aspects of the complex phenomenon.

For communication, we talk about something. It is based on our background common knowledge. That is how topics are possible. However, often we over-/under-assume the other party's knowledge and we need topic management. Focusing is to pay attention to some particular item in our expression because of our limited cognitive resources. Contrastive Topic involves both aspects in the semantics/pragmatics interface, probably more pragmatics-leaned, with presupposition/implicature effects. We could see some special prosodic features involved in the phenomenon in both languages. It cannot be independent of syntactic structures, either. It is an enormous area of linguistics and more, awaiting everyone's future research.

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CHAPTER 13

The Pragmatics of Signs, the Semantics of Relevance, and the Semantics/Pragmatics Interface

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Avoiding, minimizing or simply ignoring the question of the semantics/pragmatics interface might be the wiser attitude to adopt, as its alternative supposes nothing less than to avoid simultaneously:

(a) ignoring the semantics (and/or different uses) of the adjectives *semantic* and *pragmatic*;

(b) giving definitions of semantics and pragmatics in which specific (and narrow) conceptions of one the disciplines directly leads to wide definitions of the other;¹

(c) considering that which semantics is about would be clear;

(d) considering that semantics should be the study of what is *semantic*, and that pragmatics should be the study of what is *pragmatic*;

(e) considering semantics and pragmatics as two different research programs or perspectives on what would be fundamentally the same matter;

(f) considering, within an interpretative perspective, that semantics and pragmatics should be defined by the role they each play in the interpretative process and/or by the kind of mechanisms involved;

(g) considering that either semantics or pragmatics should account for the meaning of utterances.²

Hence, the aim of this article will be, through the discussion and clarification of each of these issues, to show that his question is not secondary for any of the two disciplines. This will allow for a direct (or indirect) account of two of the most interesting aspects of the semantics/pragmatics interface: the description (and understanding) of the pragmatics of signs and of the semantics of relevance. The whole process leading all along to a conclusion which can already be spelled out, even if what it means exactly requires all the initial developments to be fully understood:

Even if semantics and pragmatics are two disciplines with two clearly distinct objects and separate goals – and which, although working often on the same fields and data, are exploring them in a different perspective and looking for completely different kind of traces, – **what they actually find** – and not what they search – **is often very similar.**

In that sense, it can be said that **the main interface between the two disciplines could be their own results.** As we shall see, in many, if not most, cases, whatever the semantician may observe has its strictly pragmatic counterpart, and vice-versa.

This is probably what makes the question of the semantics/pragmatics interface a very interesting and important question for both disciplines: good semantics requires good pragmatics (and vice-versa). Not only, to quote E. Benveniste (1974,

¹ Which, in Lakatosian terms, means that the definition of one of the disciplines serves as a protective belt for the other.

² A position defended for instance by R. Kempson (1996, p. 561), when she considers that because semantics is the “*study of meaning in natural languages*” and pragmatics “*the study of how utterances are interpreted*”, which admittedly should be “*one and the same task*”, then it must be assumed that they should be considered only as “*quite discrete research programs*”.

p. 134), because “*Nihil est in lingua quod non prius fuerit in oratione*” (Nothing is in language structure that was not primarily in speech),³ but also because it might be the case that the description of the meaning of linguistic units and the description of the constraints on saying (and talking) requires the same language of description.

In the first part, the discussion will be based as much as possible on a strictly descriptive, and not normative, approach. Which means that our task will not be to decide *a priori* what is or what is not actually *semantic* or *pragmatic*, or if this or that approach to semantics or pragmatics should be considered as reasonable, interesting or promising, but to understand why and how it can be considered so. Large parts of this article will be based, sometimes extensively, on recent articles written with Pierre Cadiot.⁴

1. Clarifications

1.1. The complex semantics of the adjectives *semantic* and *pragmatic*

If we consider the way the adjectives *semantic* and *pragmatic* are and have been used, from Wittgenstein and Morris to Austin, Benveniste, Grice, Ducrot and Sperber/Wilson, that is if we try to understand what is normally considered as being (rather) *semantic* or (rather) *pragmatic*, and why, then the first observation is that the semantics and uses of the two adjectives are clearly dichotomous: what is *pragmatic* is what is not *semantic* and vice-versa.

However, it must also be noticed that within this constant opposition and dichotomy, the individual nature of each element appears to have changed with time, and from perspective to perspective, a change modifying simultaneously the two elements of the pair:

linguistic	<i>versus</i>	non linguistic
code	<i>versus</i>	use
sign/world relation	<i>versus</i>	sign/users relation
truth	<i>versus</i>	action
language structure	<i>versus</i>	language function
meaning	<i>versus</i>	force
meaning	<i>versus</i>	relevance
conventional	<i>versus</i>	non conventional
truth conditional	<i>versus</i>	non truth conditional
memorized information	<i>versus</i>	locally accessible information
constative	<i>versus</i>	performative

³ Exactly the way fossils and living beings are related, i.e. with some kind of living beings (or some aspects of life) leaving almost no fossilized traces, but not the other way round.

⁴ Cf. (Cadiot and Nemo, 1997a, 1997b, 1997c; Nemo and Cadiot, 1997a, 1997b).

representation	<i>versus</i>	action
message	<i>versus</i>	interaction
sentence's meaning	<i>versus</i>	speaker's meaning
sentence	<i>versus</i>	utterance
explicit	<i>versus</i>	implicit
direct	<i>versus</i>	indirect
lexical meaning	<i>versus</i>	contextual interpretation
proposition	<i>versus</i>	speech acts
what is said	<i>versus</i>	what is communicated
locutionary	<i>versus</i>	illocutionary
coded information	<i>versus</i>	inferred information
monolog	<i>versus</i>	dialog, conversation
word	<i>versus</i>	discourse
type	<i>versus</i>	token
abstract	<i>versus</i>	concrete

and in French

<i>langue</i>	<i>versus</i>	<i>communication</i>
<i>langue</i>	<i>versus</i>	<i>langage</i>
<i>compétence</i>	<i>versus</i>	<i>performance</i>
<i>signification</i>	<i>versus</i>	<i>sens</i>
<i>invariant</i>	<i>versus</i>	<i>variant</i>
<i>dit</i>	<i>versus</i>	<i>dire</i>
<i>structure</i>	<i>versus</i>	<i>énonciation</i>
<i>objectivité</i>	<i>versus</i>	<i>intersubjectivité</i>
<i>information/description</i>	<i>versus</i>	<i>argumentation</i>
<i>monophonie</i>	<i>versus</i>	<i>polyphonie</i>
<i>posé</i>	<i>versus</i>	<i>présupposé</i>

Because of such oppositive and dichotomic semantic frames, the question of the semantics/pragmatics interface could seem to be somehow irrelevant, especially if the *semantic* and *pragmatic* dimensions are thought to be strictly complementary and autonomous dimensions. This is why, as a matter of fact, the only real difference between what has been called “semanticism”, “pragmaticism”, and “complementarism” lies in the relative importance which is given to one or the other poles of the opposition:

- “semanticism” assumes that the second aspect is always of minor (or at best secondary) importance,
- “pragmaticism” on the other hand assumes that there is actually nothing semantic,
- “complementarism” tends to consider the two poles as equally important.

I shall not discuss here the heuristic limits of such oppositions: among many problems, it is clear for instance that most of them tend to present as equally systematic

the two poles, even though one of them, the pragmatic one usually, is given an “all that is not *X*” kind of definition. This tendency, especially when it derives from a truth-conditional definition of what is *semantic*, leads at best to contradictory approach to pragmatics, and, most of the time, simply turns pragmatics into an impossible mission.

1.2. Table of uses

The main problem, in effect, with this dichotomous perspective lies elsewhere: it is due to the fact that all those frames are not really consistent one with another, and that, to formulate it in the simplest terms, there are at least two very different uses of the word *semantic* and *pragmatic*.

The adjective *semantic*’s first use, which is sometimes the dominant use, is consistent with the idea that what is *semantic* in language is whatever is directly attached to the signs (or other linguistic entities⁵). While the second use, clearly dominant in the part of semantics directly influenced by the philosophy of language and logic, is consistent with the idea that truth or representation should be the central notion of semantics. And hence that semantics should be the study of the sign to world relationship.

Because of this double bind, the center of gravity of semantics appears to have been the syncretious attempt to explain signs in terms of designation, establishing a direct link between the two senses.

This double meaning of *semantic* has had direct consequences on the understanding of what is *pragmatic*. On one hand whatever is not attached to the signs (or other linguistic entities) will be called *pragmatic*, and on the other hand what is not truth conditional will be called *pragmatic*. Those two divergent approaches to pragmatics, which would oppose, for example, Wittgenstein’s semiotic scepticism and Morris’s signs to users relationship,⁶ have remained separated until now, contemporary pragmatics for example splitting consequently into two main directions:

- a cognitive approach, centered on communication, implicitness and inference, but fairly representational, as it manipulates only assumptions (propositions and opinions),
- a biotic approach, with emphasis on action (“talking is acting”) or later on interaction, centered on people or interpersonal encounters, dialog and conversation, indirectness.

If we call respectively S1 (sign/signified) and S2 (sign/world) the two meanings of *semantic*, and P1 (communication) and P2 (action or interaction) the two meanings

⁵ The thesis of pragmatism is that there is nothing which would be attached to the signs.

⁶ Mentioning here Wittgenstein or Morris does not mean that they would be at the origin of this distinction, but only that Wittgenstein’s critique of semioticism, i.e., of the idea that meaning would explain use, is of a different nature to Morris’s attempt to take into account the “biotic” aspects of language.

of *pragmatic*, it becomes inevitable that there are certain things which will be *semantic* in one sense (S1 or S2) but not on the other, meanwhile other things will be *semantic* in both meanings (S1 and S2).⁷ The same will happen with *pragmatic*: certain things will be *pragmatic* in one sense or the other or in both (non linguistic and non truth conditional). Hence, in the two cases, there will be no less than three different semantic reasons to call something *semantic* or *pragmatic*. This allows for a lot of confusion in any debate which does not make explicit the consequences of such a situation: it is impossible to consider that something is either *semantic* or *not*, if it is clear that something can be both *semantic* (S1) and *not semantic* (S2), or vice versa.

In order to represent the situation created by these four uses of the words *semantic* and *pragmatic*, Figure 1 includes all of them with the linguistic/non linguistic opposition on the horizontal axis and the representation/interaction opposition on the vertical axis. The northwest corner contains what may be called either “linguistics Pragmatics” or “discourse Linguistics (Semantics) (dL) or even “interlocution Semantics and Pragmatics” (iSP), the northeast corner all “Pragmatics of interaction and conversation” (iP and cA), the southwest corner contains either “cognitive Semantics” (cS) or “Pragmatics of communication” (Pc), and finally the southwest corner includes “linguistic Semantics” (lS) and its interface with “logical Semantics” (loS).

This, of course, allows for the complete re-opening of the question of the semantics-pragmatics interface: because there are many things which obviously will satisfy both S1 and P2 and because there are many other things which will satisfy both S2 and P1, the semantics/pragmatics interface is not an empty box or a purely theoretical and academical question: it can be studied empirically.

But this, as we shall see, is not the whole problem: there are also plenty of things which satisfy neither S2 nor P2, but are part of S1, that is, part of the linguistic meaning of some, if not most, signs.

1.3. *The origin of the double meaning of the adjectives semantic and pragmatic*

Before developing all this any further and before defining semantics and pragmatics themselves, it is also important to understand why the adjectives *semantic* and *pragmatic* actually have this double meaning.

The answer to that question is not so difficult. If these two senses exist, it's because they answer two rather different questions:

- the first distinction (S2/P2) is founded on **the nature of the information** the utterances convey.
- the second distinction (S1/P1) is founded on **how this information is conveyed**.

⁷ And hence prototypical “semanticity”.

It is beyond any doubt, and has been extensively proved, that utterances, if they convey information about the world (S2), convey as well a definition of the addressee, images of the persons involved and of their status, images of the exchange or interaction itself (all this P2), etc.

On the other hand, when it comes to the question of how this information is conveyed, or in other words, of how the hearer gets access to it, there are, once again, equally important possibilities: it can be obtained directly from the words or expressions themselves (S1) or by pragmatic means (P1), or, most of the time, by combining both. And thus, **it is both possible to get pragmatic information by semantic means, and possible to get semantic information by pragmatic means.**

For the study of those two questions, new precisions are necessary. The first of the two programs – studying how words convey pragmatic information – has been developed quite extensively within what could be called the French school of pragmatics.⁸ The second program has been developed in two rather different directions:

- the Gricean and post-Gricean direction (Sperber and Wilson, 1986a, 1986b), which has focused on how standard semantic information – i.e., information about what is the case or not, or what exactly is the case (Carston, 1988; Récanati, 1989; Moeschler et al., 1994) – can be obtained by pragmatic inferences.
- studies of the semantics of human interaction (Wierzbicka, 1991), of the semantics of illocution (Berrendonner, 1982), or of the semantic conditions of relevance and interlocutive value (Nemo, 1988, 1992, 1995, 1997), with a focus on how non-standard semantic information can account for the meaning, illocutionary, perlocutionary or speech value of utterances, i.e., of their relevance, force, orientation, ratification value, etc.

Of these two programs and three directions, only the first direction of the second program needs not be developed here. The other two on the contrary, i.e., the pragmatics of signs and the semantics of relevance and interlocution, will be developed all through this article.

1.4. *Fields, traces and objects*

Another source of considerable confusion when it comes to understand the scope of semantics and pragmatics as disciplines, and not the adjectives *semantic* and *pragmatic*, is the fact that it is essential to distinguish between:

⁸ In the French-speaking world, and not only in France, this program was first called “linguistique de l’énonciation”, following E. Benveniste (1969) and later “pragmatique intégrée”, following O. Ducrot (1972). Most of what is known as the “Théorie de l’argumentation dans la langue”, also developed by O. Ducrot and J.-C. Anscombre (1983), belongs to this program: it is not at all a theory of argumentation, but a description of the argumentative dimension of ordinary language and of the signs themselves.

- what a discipline tries to understand, in other words its object,
- what must be studied in order to do so, in other words the fields and data,
- what exactly has to be looked for in the fields and data, i.e., indirect evidence of the object, what we shall call from now on the traces of the object.

Semantics and pragmatics, as we shall see, have in common that what they have to understand, their object, is not directly accessible. Consequently, what they directly work on cannot be identified with what they actually study,⁹ but to fields which must be explored in order to gather indirect evidence (traces) to prove the existence of such or such semantic content (or pragmatic constraints). They also explore more or less the same fields and data, even if their methods of collecting are quite different and even if they are looking for quite different kind of traces. Thus, a large part of the semanticists or pragmaticists practical knowledge is a knowledge about what to look for and where (or how), i.e., either a capacity to find and understand “natural fields” or to create experimental and artificial ones.¹⁰

Despite the very general tendency to give more importance to such or such type of traces (and consequently to the corresponding fields), it is clear that traces may be found on all kind of fields. It is, for example, possible to find completely different traces (linguistic, cognitive, or interactional) of any pragmatic constraint or semantic information. Of course, the productivity of all fields may not be the same, and up to a certain point competition between the different fields is certainly stimulating, but this should not lead to confusion. Defining pragmatics as “*the study of those relations between language and context that are grammaticalized, or encoded in the structure of a language*”. (Levinson, 1983, p. 9), is as problematic as considering only fossils to define how life would be. But at the same time, what is correct in this assertion is the methodological principle that underlies: pragmatics is different from, let's say, philosophy of language, because it looks for traces, and grammatical traces, for example, of pragmatic constraints. But, as was just mentioned, the mistake which must be avoided would be to believe that only certain types of traces should be taken into account. Or that these traces should be considered separately, cognitive pragmatics looking for purely cognitive traces, inferential traces, for example, while linguistic pragmatics would look for lexicalized or grammaticalized traces, and interlocutive pragmatics would look for traces in conversation or dialogs of constraints on interlocution.¹¹

⁹ This of course is important to understand the nature of the relations which exists between pragmatics and, for example, conversation, discourse or argumentative studies.

¹⁰ In a way, this relationship is similar to the relation between paleontology and geology: the fields that paleontologists have to explore cannot be explored without extensive geological knowledge, but what paleontologists actually find are life forms, something which is outside of the scope of geology.

¹¹ O. Ducrot consequently protested against the use of discourse laws as a protective belt for informative and logicist conceptions of semantics. It must indeed be recognized that Grice's maxims all deal exclusively with informativeness. And that the question of the importance of relevance (or conversational maxims or discourse laws) in the interpretation of the sentences themselves has only started to be seriously considered recently (Carston, 1988; Récanati, 1989; Moeschlet et al., 1994). To quote Réca-

If, for instance, we consider the difference between O. Ducrot's laws of discourse (1972) – namely the *loi d'exhaustivité* (exhaustivity law), or the *loi d'abaissement* (law of lowering) – and P. Grice's (1975) conversational maxims, it is clear that they focus on different kind of traces: O. Ducrot, a linguist, is postulating discourse laws to account for the observation of unexpected semantic interpretation of the sentences themselves, meanwhile P. Grice, a philosopher originally, postulated the existence of conversational constraints mainly to account for implicatures. Hence, within the Gricean perspective, a dichotomic perspective can be maintained, according to which there is more in utterances than the information the sentence conveys, even though this perspective is inadequate for the data (traces) Ducrot's laws of discourse were designed to account for. Given the closeness of, say, the law of exhaustivity and the maxim of quantity, but also given the fact that those two mechanisms mainly differ in the way the semantics/pragmatics interface is considered, it is clear that Ducrot's examples are linguistic traces of a phenomenon which in the Gricean perspective is not meant to leave linguistic traces but only inferential ones. For example, the fact that somebody can answer *yes* to the question:

(1) Avez-vous 18 ans? (Are you 18?)

even if (s)he is actually more than 50 years old,¹² does not allow us to consider that there would be on one side, the information which is said (and coded) – the semantic information – and on the other side, conversational implicatures (what is communicated but not said). Consequently, it is clear that anybody who wants to consider simultaneously both kind of traces will have to look for mechanisms able to account both for linguistic traces and for purely cognitive ones. The interest of example (1) is that the interpretation of the question cannot be called an implicature: the fact that it actually makes such or such kind of difference to be 18 or not (to be 18 or more, or not) is on the contrary a *garant* (guarantor, i.e., supposition) of the uttering of (1). And thus the interpretation of what is asked (and said, Récanati, 1989) directly depends on the understanding of the difference at stake, allowing for the answer *yes* to be the only relevant one (compared to an answer such as “No, I’m 54”, which would not only be considered odd but probably as violating the maxim of quantity). But then, it must be remarked that the supposition that what is said (or asked) is relevant *insofar* as it makes a difference, is by no means limited to such examples. It can be observed both with Gricean cooperative traces such as the fact that people are not supposed to answer “It is right after the second traffic lights” to the question “Do you know where the closest Gas

nati “Since conversational implicatures follow from the speaker’s saying what he says, the generation of a conversational implicature presupposes that something has been said”, the problem, very often, being to know what exactly has been said and how it can be known.

¹² And the other way round, not being 18 years old normally means being less than 18, exactly the way in France “not earning 5000 francs” normally means earning more than this sum meanwhile “not earning 20 000 francs” will mean earning less, etc.

station is?"', if they know that it is closed. And with tautological utterances, as we shall see later on. Hence, taking into account the diversity of traces the same constraint can leave appears to be an important methodological requirement to avoid the recurrent tendency to build global theories of language use on specific kinds of traces.

We shall consider now two other examples of the issues at stake here. Saying *J'ai à faire*, for example (There is something I must do, I am busy), as an answer to the question *Que fais tu demain?* (What are you doing tomorrow?) indicates, among other things, that what precisely I am doing is none of your business. In a sense, this answer is uncooperative: it gives less information than was expected by the addressee. But by not giving complete information, the speaker actually indicates that the matter is a private one (and shouldn't be investigated any further). Either because the hearer is not entitled to know the exact answer, or because the speaker does not want to disclose it. Here, once again, we can observe that the problem is not the incompleteness of the information, but the nature of the relation between the interlocutors (or the relation they have with what is not being said). This, of course, is clearly a pragmatic phenomenon – as it deals with questions such as the question of privacy of information¹³ – but in this case, it has been lexicalized, so to say, in the word *affaire* itself, a very successful¹⁴ delocutive derivation.¹⁵

As a matter of fact, the polysemy of this noun in modern French can be directly put in relation with it: if *une affaire* may mean a bargain, it is clearly because the word *affaire* indicates that whatever is in question (buying a house, for example) is something which should be kept for oneself and not left to others. The very same thing could be said of the use of *affaire* to name personal belongings. But the reality of the semantic fossilisation of this pragmatic phenomenon cannot be understood without reference to the law of exhaustivity (or maxim of quantity) on one hand, and on the other hand without considering the argumentative or perlocutionary dimension of the semantic transfer which has occurred: saying *J'en fais mon affaire* (I'll take care of that/ I'll deal with it) or *Ce ne sont pas mes affaires* (This is not my business), may then mean "you can leave it to me and stop being concerned about it" or "I am not concerned, I must stay away from that". Exactly the way

¹³ Even if this question has not been studied extensively, there is no doubt that it would confirm that there are interpersonal constraints on questioning and that consequently, a purely cooperative or cognitive account of the constraints on the quantity of information is untenable. If there are obviously cooperative constraints on conversation, there are also interpersonal constraints on informative cooperation. Not all questions are legitimate ones, and answering is therefore not an obligation, when those conditions are not fulfilled.

¹⁴ The same derivation may be observed in many languages: Greek, Latin, French, English, German. For a complete presentation, see E. Benveniste (1969).

¹⁵ The notion of delocutive derivation was coined and developed by E. Benveniste to describe words whose meaning is derived from the use of a locution. To *encore* would be an example in English, another being the change of meaning of the word *salut* in French, from the health sense to the greeting sense of meeting, because of the use of the locution in encounters as a greeting device.

saying *C'est une affaire de femmes* (It's women business) implies "men should not interfere" or "men should not be interested by that". Such directive 'implicatures' are thus directly part of the semantic content, but this content is itself an inferential and delocutive consequence of the maxim of quantity not being respected.

Hence, it is not only the origin of the semantic meaning which is pragmatic, but the semantic meaning itself. The word *affaire* has 'intrinsically' a pragmatic orientation: **the conventional meaning includes the perlocutionary value of using the term**. Saying *Ce n'est pas ton affaire* (This is not your business) always means something like *Ne te mêle pas de ça* (Don't get involved!).

My second example will show even more clearly how interdependent some levels which are usually considered as autonomous can be. It concerns a conversation between two participants in a conference. It started with the question "Did you read my husband's book?" and the answer "No". If this small exchange is semantically "flat", it is not so on another level: despite the fact that the answer was nothing but the truth, saying "no", somehow, was face-threatening. Without insisting on this point, which deserves an explanation on its own, what we shall focus on is the observation of the way the reparation of such a threat can actually be achieved: to weaken or cancel the threatening value of the answer, one has to give extra information – the fact of being terribly busy, to work on a different subject or, following one of Leech's maxims of tact (threaten your own face to avoid . . .), to be quite unprofessional as far as reading the literature is concerned, etc . . . – which would convey the idea that reading the book was unlikely. In fact, it is clear that the more impossible or improbable it was to read it, the less threatening the fact of not having read it will be. Thus, and sometimes extensively, the continuation of the conversation may deal with information and topics whose link with the initial exchange is only the fact that they carry out a minimizing quantification of the possibility of not *P* (with *P* being the face-threatening fact) and consequently are part of a completely implicit process of reparation. Hence, two apparently independent realities, modal quantification on one hand – i.e., informing not of what is the case, but of what was possible and how possible it was – and interpersonal management of conversation on the other hand, interplays here throughout the whole conversational exchange.

In other words, this example shows not only that interpersonal considerations are often more important than the simple truth of what is being said – and consequently that most of the conversation concerns the (implicit reparation) of a FTA – but also, to return to traces, that the face-threatening potential of the answer directly depends on modal considerations about the possibility – that Duns Scott (see Vuillemin, 1984, pp. 112–113, 266) used to call "the power of the opposite" – for things to be (or have been) different from what they actually are. But this phenomenon, which leaves here a trace in conversation, may leave traces in the words themselves: the word *even* in *Even Paul came* indicates, among other things, that if Paul's coming to a party is more significant than the coming of other people, it is because Paul normally do not go to parties. And once again this could be shown

with all the words – such as the French *décidément* or *encore* (or the English *yet*) – that deals, among other things, with the possibility for things to be different from what they are.

However, the importance of this modal slope (Nemo, 1995) is not only conversational or linguistic. Purely cognitive traces can be found too: beating England in rugby is not the same thing for the French team as beating Ireland, simply because it is fairly possible not to beat the English team – it happens only every ten years or so – meanwhile beating Ireland is kind of normal. As a consequence, if a victory over Ireland is just a piece of information, a victory over England is an event (and vice versa in case of defeats). With, as an illocutionary consequence, that the latter would be clearly announced meanwhile the former is only communicated. It may thus be said that the very same phenomenon affects equally cognition, illocution, lexical content, conversation microsemantics, etc ... and each time, leaves traces of very different kinds.

Semanticians, pragmatians, and here cognitive scientists too, despite using different nests and at different places, are actually capturing the very same fish: there are much stronger links between linguistic, sociological and cognitive constraints than what is usually believed.

1.5. *Signs, objects and users: the missing link*

It must be noticed first that, for a long time, defining pragmatics has been the only real task of pragmatics. And that if pragmatics has stopped being an almost purely programmatic discipline, it is thanks to people, philosophers mainly, who where not pragmatians, and who have done it in unexpected ways. This has been the case because of the codefinition of semantics and pragmatics, and because this codefinition was itself based on a definition of semantics which has remained largely unquestioned. With time, of course, the status of pragmatics has changed: if for long it was nothing else than the wastebasket of semantics, it has gradually become more its car handyman mechanic, with so many reparations to be paid for as to pretend becoming the owner of the car. In that sense, and in Lakatosian terms, it is clear that for a long time pragmatics has been the protective belt of both semantics and immanent linguistics.

It must also be noticed that intensional definitions of semantics and pragmatics are extensionally always too narrow or too wide: they either leave a large part of what semanticians and pragmatians actually do out of the scope of each discipline, or give pragmatians the task of describing everything involving language in human life. The double meaning of the adjectives *semantic* and *pragmatic*, combined with the difficulty distinguishing between subject/object, fields and traces, is however enough to explain this multiplication of possible perspectives on each domain.

But this, unfortunately, is only a part of the problem, which is that there are obviously many problems any theory of language must account for and which just do not fit neither in the ordinary definitions of semantics nor in any definition of pragmatics per se.

It is sufficient for instance to consider Morris's definition of semantics and pragmatics to understand that from the very start, this opposition lacked semantic consistency and was unfit for the description of any **human** language. What do Morris's definitions say? That semantics is the study of the relation between signs and denotata and that pragmatics is the study of the relation of signs with their users. So, why should that be problematic? Simply because, if Morris's dichotomy takes into account relations between signs and objects, and relations between signs and their users, **it ignores completely the existence of relations between people and objects.**

But why should those relations be taken into account? Simply because it is just impossible to account for the relations between signs and their users, or between signs and objects without doing so. **A people-free semantics is just as impossible as an object-free pragmatics.** In this perspective, it is correct to consider that contemporary semantics and pragmatics have not yet completely broken away with logical empiricism's dream of an objective language that would describe an abiotic world, leaving to pragmatics the "*biotic dimension of semiosis*" and of language, to quote Morris (1971, p. 43).

As far as semantics is concerned, this means that human languages just cannot point to a people-free world, to a neg-anthropised world and that if language is not a simple one-to-one mapping of words to things, it is not only because there are relations between signs and their users but mainly because there are direct relations between the latter and the objects.¹⁶ The other way round, that is concerning pragmatics, the problem is strictly the same: it is impossible to understand the relations between signs and their users, without understanding the relation between them and the objects which are qualified by those signs.

To demonstrate this, we shall start with a few pragmatic examples. And consider utterances such as "It's hot in here" or "There is some beer in the fridge", when they are used as indirect speech acts to say something like "Could you open the window?" (or "Would you mind if I open the window?"), or "Help yourself if you are thirsty!" In the two cases, most of what is implicit, and in particular the implicit

¹⁶ This question has not been completely overlooked, but it has been considered in a way that evaded it, namely that the fact that somebody hates communists wouldn't affect the meaning of the word *communist* itself. But what is worse is that the problem has sometimes been the center of considerable debates without appearing as such, in particular with Frege's distinction between meaning and reference: it is obvious that the uses of two different expressions (*the morning star* and *the evening star*) to refer to the same object (Venus) is nothing but the trace of the existence of two different relations – one kind of relation, observation (with the eyes only), but at two different moments – with the same object and of a tendency to name things by the kind of relation we have with them. In that sense, Frege's distinction implies that the *meaning* of an expression is what it indicates about the relation we have with it.

topic of the utterances, concerns the relation people have with heat (avoiding it or changing it) or beers (taking them and drinking them). But there is here more than that: most of what makes the utterances relevant are the facts that people are not supposed to go and pick up a beer in a fridge which is not theirs, nor to open a window in the same circumstances, and not even sometimes to do it in their own place without the agreement of those they are sharing a room with. This is why the second utterance is in fact mainly used to allow the hearer to pick up a beer and drink it. Hence, it is clear that objects cannot be understood outside of the relation we have with them, and that this relation is simultaneously perceptual, functional and, as we have just seen, socially constrained.

To move now to semantics, it can be shown (Cadiot and Nemo, 1997a, 1997b) that many if not most uses of a word like *lit* (*bed*) or *nuit* (*night*) cannot be accounted for without considering the relation we have with the object bed, i.e., the fact, for example, that we lie/lay on it (*s'étendre* in French). It explains not only the fact that we can say things such as "I'm going to bed" or "I slept well last night" in situations where there is actually no bed or no night,¹⁷ but also the meaning of the morpheme itself as may be observed with *lit* in *litière* (*litter, bedding*), and many other conventional uses, such as *lit de la rivière* (*bed of the river*), *sur son lit de mort* (*death-bed*), *premier lit* (*first marriage*), or idiomatic expressions such as *faire le lit du fascisme* (*to make the bed of fascism*), which actually means (literally) *permettre au fascisme de s'étendre* (*to allow fascism to spread*). It would be on the contrary completely useless and helpless to try to account for all those uses on the basis of the set of properties of a prototypical piece of furniture.

But the problem is not only that the relation we have with things is part of the semantic content of words, in which case it would be enough to include this information in the semantic description of the object itself, by adding functional features or qualias selecting prototypical relations (such as *read* or *write* for *book*). The problem is that the kind of relation we have with things may turn to be the deepest and hence most important semantic feature of morphemes.

To illustrate this, three different approaches (fields) can be developed (explored). The first is to consider polysemy, the second diachrony and the third non-denominative uses.

2. Polysemy and EP

To start with polysemy, we shall consider two concrete examples, the first one being the French word/morpheme *table*.

Table, as a word and as a morpheme, can be used for things as diverse as *une table à manger* (*dining table*), *une table à langer* (*changing table*), *une table de*

¹⁷ A north pole explorer might perfectly say that, even if he would agree at the time that there are no nights for months in those regions.

multiplication (arithmetic charts), *une table des matières* (book contents), *une table de montage* (editing bench), *un tableau* (board, chart, table), *un tableau de bord* (instrument panel, dashboard), *une tablette* (shelf, bar), *un tableur* (spreadsheet) and, in English, a *timetable*. It may also be used in expressions such as *les Tables de la loi* (The Tables of the law), *dresser un tableau de la situation* (to paint the picture of the situation), *se mettre à table* (to tell everything).

Despite this designational polysemy, it is clear that in all the cases, what **the morpheme *table* indicates is that what it refers to allows the arrangement¹⁸ of various elements (including people) which must be simultaneously available and accessible for a certain purpose**. As a matter of fact, there is thus no difference whatsoever concerning this definition between timetables, book contents, dashboards, spreadsheets, charts, editing benches, changing tables, etc ... And this is true even when the uses in question are somehow metaphorical: saying of a suspect that *il s'est mis à table* to say that he has started to give information and has given it all,¹⁹ exactly like *dresser un tableau* – which is also a strictly verbal activity – consists in giving **complementary** information in order to facilitate the understanding of a situation.

Here, once again, the idea that the semantic meaning of the morpheme *table* must represent a certain designatum, prototypically the piece of furniture, is extensively falsified. With as the result a considerable simplification not only of the question of semantic polysemy, but also of parasemantic questions such as the question of metonymy: if *tables* are not objects, but devices to gather elements, then the observation of the fact that in expressions such as *mettre la table* (to set the table) or utterances such as *Seules les tables propres, bien rangées et silencieuses pourront sortir* (Only clean, arranged and silencing tables will be allowed to go out), the word *table* never referred to the piece of furniture itself (and only once to its surface) but to the elements, including (given the fact that eating is in most human societies a rather gregarious activity) human beings, that tables bring together, obviously forces us to reconsider the question of metonymy.

This 'availability' feature is as a matter of fact so strongly attached to the morpheme *table* that it can also be observed in the verbal form: *tabler* (to bank on), for example, in utterances like *Le gouvernement table sur une croissance de trois pour cent* (The government counts on a 3% growth), convey the belief that one could have (in the future) something at one's disposal for a specific purpose (to establish the budget, to fight unemployment, etc.).

As regards polysemy – certainly one of the most difficult issues in semantics – and its relation with what we have called the **extrinsic properties (EP)** of objects (Cadiot and Nemo, 1997a, 1997b), a second example, the French noun *pièce*, may be considered.

¹⁸ In French, the meaning of *table* is linked with the verb *disposer*, in the two symmetrical interpretations of that verb: *to arrange*, *to position* on one hand, and *to have at one's disposal* on the other.

¹⁹ But also that to let know that information is now accessible, inducing answers such as *Alors?* (So?), i.e., a request to be given the information in question.

Pièce is a highly polysemic word with no salient prototypical object to comfort the evidence of any designational meaning. It is used for all kind of things: it can refer to *pièces de monnaie* (coins), *pièce de logement* (rooms), *pièce d'artillerie* (cannon), *pièce de tissu* (length), *pièce de théâtre* (theater play), *pièce montée* (layer cake), *pièce détachée* (spare part), *pièce de musée* (museum item), *pièce de bœuf* (piece of beef), *costume trois-pièces* (three-piece suit), *pièce à conviction* (exhibit), *pièce rapportée* (patch), *deux francs la pièce* (two francs apiece).

Of course, as Wittgenstein would have said, there is nothing that all those things have in common: what would a coin, a room and an exhibit have in common which could explain the fact that they have the same name?

But what is worst concerning *pièce* is that it seems impossible to postulate here any derivational process, which would explain an hypothesized passage from the supposedly original meaning (and prototypical designation) to all the others, as if, for example, all the uses of *table* could be derived from the "furniture" meaning. There is in effect no way to throw all the meanings of *pièce* except the good one in the parasemantic wastebasket which gathers all the to-be-looked-out-one-day-for-derivational-explanations uses. So what must we do?

What has to be avoided first is to take the answer to the question "What is an X?" for an answer to the question "What does X mean?". Despite more than a century of warnings about it, it is clear that in semantics, the two questions are being frequently considered as equivalent, mainly because of the ordinary definition of semantics itself: it is fairly common among philosophers and even linguists, since Quine, to consider that the meaning of a linguistic unit (morpheme, word, turn, sentence, etc.) is what it represents.

But here, as was observed already with *table*, taking into account the relation we have with things often leads to taking into account the relations things have between them in the use/relation we have with them. Hence, we shall say that **the word *pièce* indicates that what it refers to, despite possible functional characteristics, must be joined with other *pièces* in order for the whole to be functional (or the other way round).**

This means, for example, that naming *pièces* the rooms in a flat indicates that each of them is not independent of the others, that the rooms are functionally interdependent, exactly like *les pièces d'une machine* (the parts of a machine), that are both playing an individual role and useless without all the others. This is also why there are *des deux-pièces* or *des trois-pièces* (three roomed flat), but *des studios* (studio flats) and nothing as *des une-pièce*. This is why cannons are called *pièces d'artillerie*, because they must be used together, in gun batteries. This is why a costume *trois-pièces* consists of three different clothes but which have to be used together. And finally, this is why, if there are *pièces à conviction* (exhibits) in a trial, it is because *pièces à conviction* are things which must be gathered for the judges or jurors to build up their conviction. And must also be considered all together.

Hence, in most of its uses, what *pièces* indicates is that the things concerned belong with each other, *ne vont pas l'une (les unes) sans l'autre (les autres)*. This may be observed either directly, with the *pièces d'un puzzle* (jigsaw puzzle pieces) or indirectly with the use of expressions such as *pièces rapportées* to refer in families to all the in-laws, i.e., to persons who both belong to the family and weren't part of it originally. The other way round, a *pièce de X* (piece of X) will also be something that may or must be separated from the whole it belonged to in order to be used, which is also the case in expressions such as *dix francs pièce* (ten francs piece).

Three important conclusions must be drawn from the description of these two examples:

- (1) the apparent polysemy of the word *pièce* (and of the morpheme *table*) is an illusion.
- (2) semantic meaning and designation shouldn't be confused.
- (3) what a word/morpheme describes is not the properties of things themselves (i.e., intrinsic properties, IP) but the properties things have within the relationship people have with them (extrinsic properties, E.P.).²⁰

Each of these consequences is important to understand what semantics is about and its relation with pragmatics. For example, Wittgenstein's insistence on the necessity to take the use of language into account was presented as a consequence of the fact that it was impossible to find anything that would be common to all the designate of a sign. But if the problem is indeed not to find something the designate would have in common, it is because semantic meaning and designation are just two different things and not really here because of the way we use words or the importance of use in the determination of meaning.

There is, however, a relation between designation and use, but as we shall see, this relation operates exactly the opposite way round as is normally supposed: on one hand it is true that the use of words cannot be explained in terms of designation, which falsifies the semioticist claim that it could, but on the other hand the opposite (pragmaticist) claim that words have no meaning is as false, as designation itself cannot be described outside of specific uses, either conventional or not. In that sense, the pragmaticist affirmation that meaning should be explained by the way words are used is both completely correct if it refers to designation, and irrelevant if we accept that meaning is simply not designation.

For now, and for the word *pièce*, what is clear is that the semantics/pragmatics opposition of designation and use cannot be maintained as soon as we stop forgetting that humans are in relation with things and that this cannot be considered unimportant neither in semantics nor in pragmatics.

²⁰ For an extensive demonstration of the necessity and efficiency of the distinction between EP and IP in lexical semantics, see Cadiot and Nemo (1997a, 1997b).

2.1. Conventional versus non conventional meaning

But to show how the existence of extrinsic properties (EP) puts into question such a basic distinction as that between conventional and non conventional meaning, or the difference between literal and figurative meaning, we shall consider now the example of non denominative uses of the French word *client* to refer to all kinds of things in all kinds of contexts:

a jockey to another jockey before a race, talking of the horse he will ride.

- (2) Tu te méfieras, c'est un client un peu vicieux parfois.
(Take good care, it's a rather vicious *client*/animal sometimes)

a hired killer to the person behind the assassination

- (3) Qui est mon client cette fois-ci? (Who is my *client*/target this time?)

a sport commentator about the last and next competitor of a football team.

- (4) Le prochain client d'Auxerre en Championnat d'Europe sera d'une toute autre trempe
(Auxerre's next *client*/opponent in the Champion's League will be of another caliber)

a journalist about a politician, talking of interviews

- (5) C'est un client plutôt facile. (He is a rather easy *client*)

a mother who has come to pick up one of her children in school, talking to somebody she has met.

- (6) Bon, je file, j'ai un autre client à la maison qui risque de se réveiller.
(Well, I must dash out, I have another *client*/one at home who might wake up)

a removal man to a colleague, talking about a piece of furniture.

- (7) Va falloir faire très gaffe, le prochain client coûte la peau des fesses!
(Take it very easy, the next *client* costs a bunch of money)

an astronomer to one of his colleagues in a team

- (8) Ton client à toi ce sera Jupiter. (Your *client* will be Jupiter)

In all these examples, the use of *client* is unconventional: none of the things or people which *client* refers to is conventionally named a *client*. Whether those uses should be considered as metaphors or loose talk will be discussed afterwards, but

at first sight, they could have been considered so. If we consider that *client* prototypically refers to persons purchasing goods, it is clear that none of the common properties or specific features of those persons is required to be called a *client*: there is no need to buy or be involved in anything commercial (2–8), not even a need to be a human being or even to be a living being (2, 7, 8), and sometimes; like in (3), the person who is called *client* is as unprototypical as it can be (he didn't buy the service, doesn't want the product, would pay not to receive it, etc.) while the person who has all the characteristics of a prototypical *client* wouldn't be called that way in French but *commanditaire* ('orderer').

So how should we consider such uses? Within a (semantic) meaning-free use-of-language perspective? Or within the derivational perspective of figurative sense? Or simply by taking into account what a client is in terms of the kind of relation (EP) that one is supposed to have with him? In other words, by taking into account the fact that a *client* is simply somebody (or even something) who (which) must be taken care of (or taken charge of) – in French, *dont on doit s'occuper* – no matter what exactly *taking care of* or *being in charge of* will specifically refer to in each case.

Once again, it must be underlined that *client* does not designate such or such type of things, but indicates the existence of a certain kind of relationship with any kind of objects (Cadiot and Nemo, 1997a, 1997b, 1997c). This explains the examples (2–8): the only thing which will receive a contextual interpretation in all of them is *taking care of* or *being in charge of*, which will mean either *study* (in 8), *carry* (in 7), *looking after* (in 6), *interviewing* (in 5), *being opposed to* (in 4), *killing* (in 3), *riding in competition* (in 2).

But what is more is that there is strictly no reason to believe that what we are observing is any different with the "commercial" use of *client*,²¹ which must have followed the same initial step than any of these examples. The only difference indeed being that the commercial specification of the predicate *taking care of* or *being in charge of*, i.e., *receiving*, *advising*, *helping*, etc., has become important enough to be kept in lexical memory: in all examples (2–8), but example (3), the specification must be calculated locally and is not available outside of the specific context it appears in, contrary to the commercial specification, which has acquired the indisputable semantic stability of a denominative convention. Whereas the EP alone – somebody (or something) who (which) must be taken care of (or taken in charge) – has an unlimited extension, the S(EP), i.e., the specification of the extrinsic property, will have a much narrower extension: it will concern only things that are being taken care of **in a very specific way**.

All this leads to a three step semantic description of a morpheme like *client*:

²¹ Despite the fact that this use is now the most spontaneous answer to the question "What is a client?", the original use of the term concerned indeed a political relationship, as is still apparent in a world like *clientélisme*. As this last word clearly indicates, the EP sense (*taking care of* or *being in charge of*) was part of the meaning of the original morpheme, and its use for the commercial relationship, although more successful, had exactly the same basis as any of the examples (2–8).

- an intentional step, which accounts for **all and any use** of *client* in terms of the EP *taking care of* or *being in charge of*.
- an extensional step, which considers restrictions on the extension of the morpheme **in all its uses**.
- a specificational step, which accounts both for the denominative uses, in terms of a SEP (specified extrinsic property) which limits considerably the extension of the morpheme, and for the nondenominative uses, for whom a specification of the EP must be calculated locally.

Hence, instead of considering that we should account for non denominative uses on the basis of denominative uses, as is always believed, this approach supports the idea that **semantic meaning must explain use in general, and not primarily (apparently) conventional uses**. Or, in other terms, it supports the idea that **the distinction between conventional and unconventional uses of a word or morpheme should not be confused with the distinction between denominative and non denominative uses**.

The second step deals with constraints on the extension of the EP, i.e., on the fact that the use of the morpheme may presuppose something else about the relation concerned (EP) than the nature of this relation. In our case, i.e., in all uses of *client* including utterances (2–8), the point is to notice that if a *client* is somebody or something that one has *to take care of* or *to be in charge of*, it is also necessary, to be called a *client*, **to be just one of a series of people or things with whom the same relationship is experienced**. This constraint, the one-after-another constraint, much less apparent than the others, is actually a very important constraint which leaves traces in most, if not all, of the contexts in which *client* is used. Traces such as the words *prochain* (next) in (4) and (7), *cette fois-ci* (this time) in (3), *autre* (another) in (5), *à toi* (your) in (8). Or the fact that a jockey is riding various horses one after another, and the journalist interviewing regularly politicians.

This constraint on an extrinsic property (CEP), is very important to account for the extensional limits of the uses of the term *client*. Even if the extension of the CEP is still potentially infinite, not everything which is *taken care of* may be called a *client* either: the extension of *client* is both infinite and constrained.

But what does all this imply with regards to the conventional meaning versus non conventional meaning distinction? Clearly that what seems conventional and what seems unconventional is not so simple: here, it can be said that all the uses of the term *client* in the examples above are in fact highly conventional. What is not conventional in fact is only the designative value of the term, because all those examples are non denominative uses. But once again the extensions, not to mention the intention, of denomination, designation and meaning are different. And the idea that meaning and especially conventional meaning would be more apparent in denominative uses is simply a fallacy.

This is why, if we consider that whatever is conventional in meaning, is, somehow, semantic meaning, then we must consider that there are two kinds of semantic

information which are attached to a word: coded information, present in all uses, and designations, when they are denominative, i.e., when the noun which is used is also the name of what it is used for, which are both contextual (as they are too specific to appear in all the uses of a term) and non-contextual (as they are denominative).

In other words, what all this development actually means is that it is not possible to oppose, as is normally supposed, what would be non-contextual (semantic) and what would be contextual (pragmatic), simply because there are, so to say, conventionalized contextual meanings, i.e., information which is both contextual specifications, as it is NOT encoded information, and attached to the signs or expressions, because these specifications are actually memorized once and for all. Consequently, it is absolutely necessary to elaborate tests to separate encoded information and memorized information. Of course, we can consider that anything which is attached to the signs or expressions must be considered as semantic, but this can be true and does not imply at all that conventional meaning ought to be opposed to non-conventional meaning. There is a much wider difference between encoded meaning and designational meaning, than there is between conventional designations and non-conventional (local) ones. As a matter of fact, the only difference there is between all the uses of *client* we have studied, is that some of them have become (to a greater or a lesser extent) denominative uses. But even if semantic theories have always believed that denominative uses should be considered as semantically central, this commonsensical hypothesis is extensively falsified: there is no way we could account for an extension of the supposedly original denominative use of a term (coin for *pièce*, for example) to any other denominative use (exhibit, for example), even with many different steps. The fact is, simply, that the properties which could be semantically attached to a sign or expression by its denominative use, are not the relevant properties to account either for its apparent polysemy or for non-denominative uses.

But here, once again, accounting for semantic polysemy and for apparently non-conventional uses is in fact the same problem. Semantic polysemy and 'pragmatic polysemy', as it could be named, are basically the same process: the fact that *client* was used first for a political relationship and then for a commercial relationship, can receive the same explanation that all the non-denominative uses we had to account for: *client* may be used for anything or anybody who belongs to a series of people or things with whom the *taking care of* or *being in charge of* relationship is experienced. The fact that some of these uses become denominative ones is an interesting matter but the fact that it is secondary cannot be denied, even if it falsifies the idea that words should basically be names, and the signs symbols.

As this kind of result is a general one – there is much evidence to prove it (Cadiot and Nemo, 1997a, 1997b) – this means that if there is a direct link between encoded meaning and use (even in non-conventional uses), but that there is only an indirect link between encoded meaning and designation: therefore, describing the nouns *mont* (mount) ou *monstre* (monster) is simply not describing what is a *mont*

or a *monstre* (the designata) but describing the relationship we have with them, namely *monter* (going up) in the first case, and *montrer* (pointing to) in the second. And this also means that the conventional/non-conventional distinction ought to be deeply reconsidered to take into account the fact that if even the more local uses (*client* for Jupiter) are conventional, then the difference between lexicalized uses and non-lexicalized uses is only a matter of degree: **some uses are conventional on two counts (meaning and designation) and some are conventional on only one count (meaning)**. If, in the second case, the designation must be locally interpreted, in the first a memorized interpretation of the designatum is available in lexical memory. But the lexical memory is not the linguistic code.

2.2. *Meaning, designation and use*

Because words are simultaneously powerful and limited realities, semanticists must account both for the semantic potential of a term, and for its limited denominative name power. The ordinary mistake is to think that this semantic potential would depend on somekind of loosening of the denominative constraints, so that we should study first those denominative constraints and then the loosening mechanisms. What has to be done in fact, as all our examples have shown, is the exact opposite, and in that sense, doing semantics is not so different from describing a grammar: it could be said that a semantic description, just as a rule or a set of rules, must account for all possible uses on one side (all possible sentences), but for only those uses (no more than all possible sentences). If the expression *père biologique* (biological father) for example is possible and not at all redundant, it is because its use indicates something about the nature of the relation between the 'father' and the child, namely that the relation they had was only biological. Hence, what this expression actually describes is the complete absence of father/child relationship apart from conception itself.

The semantics/pragmatics interface, thus, appears as wide as complex: uses are explained in terms of encoded information (a typically semioticist position), but this information is pragmatic (a typically pragmaticist claim), some uses are non-denominative (which means that they must receive a local – and therefore pragmatic – interpretation) and some others become denominative ones (which means that their local interpretation is memorized and conventionalized, and becomes stabilized semantic information), these two last facts allowing for good-tempered complementarism. Moreover, it is also clear that another kind of complementarity between semantics and pragmatics must be considered: it is just impossible to account for the lexical polysemy of words like *client* without accounting in the same time for their less conventional uses.

This puts the question of meaning and use in a completely new perspective: first because there is nothing like a strictly designational meaning on one side and figurative or contextual uses on the other side, and second because it falsifies the

idea that the lexical meaning of a word should determinate both its intension and extension.

In nonliteral uses, exactly as in polysemy, what is problematic is the existence of a dissociation between the actual extension of a term – the fact that it may be used for any kind of objects – and the supposed intension of the term. The solution is to consider that the intension of a term must explain both its denominative extension and non denominative extension. The choice for semanticists is either to consider that some (and frequently most) of the extension of a term must be explained by derivational or pragmatic mechanisms (figurative sense or language use) in order to save a designative conception of intension, and considering that designation is obtained by putting together different semantic elements. To be perfectly clear on this last point, the problem for semanticists is to know whether they should consider the designative value of linguistic units as basic, and consequently those designations as semantic primitives, or whether these values are only the outputs of the semantic process, even when these results are kept in lexical memory. As this could be observed on many other examples²² than those we have considered here, what is actually needed is a non designational definition of semantics.

3. Defining pragmatics

The main problem understanding the semantics/pragmatics interface is the well-known difficulty in giving a comprehensive definition of pragmatics. As was suggested already, it might be the case that this difficulty has been greatly exaggerated meanwhile the difficulty of defining semantics was on the contrary deeply underestimated. In both cases the figure which has been proposed to describe the different uses of the adjectives *semantic* and *pragmatic* (Figure 1) is enough to account for the diversity of possible definitions. On each axis indeed, vertical and horizontal, and given the fact that on the vertical one, the position of interaction was at a time occupied by action, there are notions which as we have seen may be (and have been at one time or another) promoted to the status of central notions of each discipline: as each of them is directly linked with its counterpart, this generates as many definitions of both disciplines. definitions which are all somehow legitimate, but also highly reductionist if not normative.

Is it possible to avoid both this reductionist attitude – advocated by Levinson (1983, p. 9) and actually adopted, with other definitions, by most authors – and the so called continental open²³ approach of the question?

The answer to this question is yes, if on one hand we are able to show:

²² In Cadiot and Nemo (1997a), we have used this approach to describe the meaning of a wide range of terms, from monosemic terms such as *cendrier* (ash-tray), the terminology of kinship (*père*, father, *mère*, mother, *frère*, brother), or abstract terms such as *équilibre* (equilibrium) in economics.

²³ Not to say loose, as some authors suggest.

(1) that the diversity of characterizations of pragmatics is due to the diversity of the possible (legitimate) perspectives to a (single) subject.

(2) that pragmatics is not the study of the interpretation of utterances. Which doesn't mean that studying the interpretation of utterances is not legitimate, nor that pragmatics would have nothing to learn from it on its own object.²⁴

and if on the other hand, following some intuitions of K. Popper's (1991 [1963], p. 222)²⁵, according to which scientific activity "*should be visualized as **progressing from problems to problems***", a problem-solving approach to the definition of pragmatics is adopted.

The first assertion in effect advocates a comprehensive definition of pragmatics, that is to say for a definition of pragmatics that would account for what pragmatians actually do as (non-contradictory) answers to the same question. In other words, pragmatics should be described as an attempt to explore a multifaceted question, which happens to have as many possible answers.

To identify this question, we must first consider the various forms it has taken through time:

What is the nature of saying?²⁶

What are the conditions and constraints on talking?²⁷

What are the conditions and constraints on saying something?

What are the effects of the saying process on language structure and communicated content?²⁸

It is not so sure that a clear relation has been established within pragmatics between all those questions. Many of them are clearly interdependent: the constraints on requests, questions, directions and assertions for examples are of course different one from another.

But still, this does not prevent us from giving already a comprehensive definition of pragmatics:

Pragmatics is the study of the saying and talking process.

This definition must not be confused with the *language use* definition, mainly because it doesn't mention language and meaning at all, nor interpretation. And because this process integrates simultaneously sociological, interpersonal, inter-

²⁴ This second thesis, which will be thoroughly discussed in the next paragraphs, has been mentioned here for optimal clarity only.

²⁵ Which have received considerable developments in modern theory of knowledge and science (Laudan, 1987).

²⁶ Cf. the Austinian critique of the descriptive fallacy, i.e., of a characterisation of saying as informing and describing.

²⁷ Cf. the importance of turn-taking and face-management.

²⁸ Studying the effects of the saying process on language structure has been the goal of the linguistics *de l'énonciation*. Studying the effects of saying on the communicated content is central in the Gricean and post-Gricean tradition.

locutive and cognitive constraints. What in effect is important for pragmatics is to understand which are the different dimensions involved in the saying and talking process, and what constraints are effective in each of those dimensions. There are ritual constraints on talking, there are cooperative constraints on keeping a conversation going on, there are interpersonal constraints on speaking (taking a turn) and face-management, there are constraints of politeness on the way things may/must be said, there are cognitive constraints on the content of what is said or on the communication of information, there are interlocutive constraints on interlocutive adjustment, there are probably also processes of synchronization or distinction (Bourdieu), there are as we shall see modal and scalar constraints on what is said, and there are cultural constraints on all those dimensions, etc.

Accepting all of this as being part of pragmatics is not adopting any loose definition of pragmatics: it is a matter of fact that the saying and talking process is multidimensional, it is a matter of fact that this process does not occur in a non-socialized universe, with its different dimensions (interpersonal, societal, or in terms of *habitus*²⁹), it is also a matter of facts that the world is not culturally flat (Wierzbicka, 1991), and that the saying and talking process involves cognitive abilities and constraints. In other words, it is clear that describing the saying and talking process is describing the complex and simultaneous management of different dimensions. But all those dimensions are of equal importance for pragmatics, even though this might not be the case for linguistics.

Hence, the problem of the interface between pragmatics and linguistics lies in the fact that it is not possible to say neither that pragmatics is only a part of linguistics nor that it would be outside of linguistics, or that it would be an umbrella-type discipline above it (Moeschler and Reboul, 1994). And that assuming it to be only a specific or integrating perspective on language would also be wrong. If there are pragmatic dimensions which are interesting for linguistics, it is because there are linguistic realities which cannot be accounted for without taking into account those dimensions. And, to follow Levinson (1983) on that point, it is not illegitimate for a linguist to consider that his task is to explore only those dimensions. But, concerning this attitude, it must be pointed out:

- (1) that this reduction cannot constitute a **definition** of pragmatics itself.
- (2) that there is no way, we could know in advance if such or such dimensions actually leave lexicalized or grammaticalized traces,³⁰ and to which extent.

In more than one way, the problem we have is similar to those encountered in the study of movement: to describe a movement, for instance the movement of celestial bodies, one needs a description of space itself, and as long as space is not correctly described, no movement can be correctly described either and explaining the laws of motion is impossible. Most of what contemporary pragmatics has achieved is a

²⁹ Cf. the question of who speaks and who doesn't, or the question of when people and how people get involved or retire from conversation.

³⁰ Large parts of this article will show with the fact that the crystallisation of pragmatic constraints is actually omnipresent in language structure and lexical content.

(interactionally limited) typology of movements (speech acts) and the completion of the description of the space in which saying occurs: as of this last goal, there is little difference between those who describe the interlocutive space as a cognitive space and those who describe it as an interpersonal space, both contribute to a better understanding and description of the diverse dimensions of interlocution.

The problem for pragmatics is thus not a problem of unity of subject, as all pragmaticians actually describe the same object, the problem for pragmatics is to integrate all those results in a single representation of the interlocutive space in which the saying, talking and conversing process occurs.

But before considering this question, we should move now to the definition of semantics.

4. Defining semantics

The paradox of semantics is that its definition has always been almost uncontroversial: if it is possible to oppose within semantics, a linguisticist inspiration, according to which the sign to sign relationship should be considered first, and a logicist inspiration, according to which it is the sign to world relationship which is essential, there has been a large consensus to ignore completely the semiotic dimension of semantics.

This is why it is actually necessary to formulate clearly the founding postulates of semantics:

- (1) the task of semantics is to isolate and identify the information which is attached to signs and linguistic units.**
- (2) the task of semiotics is to study how this information is reached.**

and to question them extensively.

Concerning the first statement, there is at first sight little to add. Only that if, from truth conditional semantics to A. Wierzbicka's semantic primitives, there has always been a large debate within semantics about the nature of the information attached to linguistic units (propositions, logical forms, semantic features, qualia, etc.), the whole debate presupposes that in any case there is something such as a semantic information attached to the signs and expressions.

This axiom has however raised objections from those, like Wittgenstein, who have sometimes seemed to question the existence of any semantic content but have in fact rather criticized the semioticist idea that meaning would explain use.

It has also raised objections, in a larger perspective, within the hermeneutics paradigm (Ogden and Richards, 1923) by a direct criticism of Saussure's notion of *signifié*, as a way to evade the question of interpretation, or to give it a secondary status. This criticism, it must be noticed, remains valid today if we consider the inexistence of a real semantics of 'figurative' utterances, leaving a wide part of language use out of the scope of both mainstream semantics and pragmatics: se-

mantics is still mainly concerned with the study of 'literal' meaning and pragmatics is uncomfortable when it comes to study language uses which do not seem at first sight to have a pragmatic motivation.

The second affirmation on the other hand, as far as it concerns semantics, questions the nature of the semiotic link between linguistic units and their semantic content. From Saussure to Morris, this statement has raised little concern: both have considered language as a symbolic system and the typical semantic relationship as a relation of symbolization. Even, when, more recently, mainstream semantics has focused on categorization and cognition, leaving behind any discussion about the semiotic nature of language to adopt the thesis that language should be considered as reflecting the way our mind works, the relation of designation has remained central. As we shall see, the slow pace of the development of semantics as a scientific discipline, must be related to the constant postulation of a semiotic symbolic simplicity of language.

4.1. Semantics and semantic content

The definition of semantics, however, which follows from those two postulates, is not, it must be noticed, a normative definition: it does not advocate a specific conception of the kind of information which is attached to the linguistic signs or expressions, nor the presupposition that it should be homogeneous. In other words, it does not, as most definitions of semantics,³¹ combine in the same formulation the question and the terms in which it must be answered. Thus, it does not dream either of a language in which no discovery could be made, nor of a language that would confirm neither our most spontaneous account of language, nor such or such scholarly founded tradition. Therefore, it does not establish any distinction between descriptive and procedural information, between information on intrinsic properties and extrinsic properties, between communicated and subliminal information etc. And as a consequence, it is consistent with the self denominations of practioners: anybody who describe the meaning of words, even if, like discourse connectives for instance, this meaning is highly pragmatic, is doing semantics.³²

This is why, as was already mentioned, and as a consequence of the first postulate, the most important debates in semantics concerns the nature and representation of the information attached to the different semantic units (signs, syntagms, expressions, sentences). The most classic problems of semantics appear in effect to be direct implications of its two founding postulates:

³¹ Such as those who consider semantics to be the study of truth conditional meaning, or as the study of the logical forms of sentences.

³² It is possible to study discourse connectives in a pragmatic perspective, but then what is done is to use the metacommunicational functions of discourse connectives as a way to understand the constraints on communication.

- ambiguity and polysemy concerns the possibility of having just one access to different semantic contents, either through words (polysemy) or sentences (ambiguity);
- synonymy, semantic equivalence, and paraphrase, concerns, the other way round, the possibility of different accesses to the same semantic content;
- phenomena like presupposition or inference (in the sense that is not equivalent to implicature) concerns indirect access to a semantic content, either because this information is a background information or because this information gives access (by itself) to other information.

Another interest of this definition, which combines only the founding postulates of the discipline, is that it does not lead us to suppose that those postulates are not concealing serious problems. In fact, even though they might seem essentially uncontroversial or indisputable, there are many problems which make them appear as rather frail axioms, at least if they are understood in a traditional way, that is to say with the belief that there would be some kind of bijection between words or linguistic expressions and their meaning.

4.2. Some problems with semantic content

From a purely methodological perspective, indeed, the main problem of semantics is to prove that information is attached to those units. Therefore, the concrete correlates of the first postulate are that:

(1.1) proving that information is attached to a linguistic unit requires us to show the semantic evidence that this information is really attached to it.

(1.2) attachment of information to a linguistic unit can be revealed by traces which are found on very different fields, from distributional traces (combinatory constraints revealing the content of each unit) in syntagms, sentences, anaphors or discourse to lexical polysemy (both in synchrony and in diachrony) and non-denominative uses.

But, there are many other problems raised by those two postulates, which must receive special emphasis here because they are important to understand both language use and utterance interpretation, the two major aspects of the semantics/pragmatics interface.

As a matter of fact, it seems that the questions of semantic content, the question of semantic carriers, the question of compositionality and the question of the nature of the semiotic relations between semantic units and semantic content, should not be considered separately. And that all of them should be considered outside of the **designational paradigm**, i.e., outside of the paradigm for which answering to the question “What is the meaning of *X*?”, somehow depends on the answer to the question “What is an *X*?”.

4.3. *The psychological evidence of meaning: prototypicality and distinctiveness*

Within semantics, and especially within lexical semantics, four paradigms have been developed, among which two favour a designational account of meaning. Word meaning has been consequently considered to be a matter of either:

- **sign to sign relationship**, within the structuralist paradigm, for which linguistic units, within semantics exactly as within phonology, are the sum of all their oppositive and distinctive features. In this perspective, the content of a term is mainly differential.
- **sign to world relationship**. Within the descriptive paradigm, the semantic contents of words is a description of the set of properties which are shared by all the individuals of the class which the word refer to.
- **sign to mind relationship**, or more precisely, of **sign to world through mind relationship**. This psychological paradigm, for which the description of the semantic content of a name should be consistent with the representation we have of the corresponding object. In other words, words are believed to be linked with mental categories and representations.
- **sign to speech relationship**, the paradigm of *énonciation*, for which the meaning of words is not a matter of descriptions of such or such things but must be related to the language use of the words.

Within the third paradigm, i.e., from Rosch to Lakoff, it has been assumed both that meaning was designational and that it was centered on prototypical and cognitively salient designations. It may indeed seem plausible to consider that what would be the most closely attached to such or such sign *S* should be what people have in mind when this word/name is pronounced (or when asked to classify different members of a class in terms of representativeness). But it might be argued also that it is not because the first bird people are thinking of when the word *bird* is pronounced is a robin, that it presents any interest for linguistics, and for the semantic description of the word *bird*. For instance, (Cadiot and Nemo, 1997a), there is no reason to believe that the mere creation of new methods of artificial fecundation have changed anything in the meaning of the word *mère* (mother): it is not because these methods may turn the answer to the question “Who is an *X*?” and “Who is entitled to claim motherhood?” into a legal problem, that it actually changes anything in the meaning of *X*. Simply because the word *X* is not a determination of who is an *X* or not.³³ the meaning of a word is not to designate the things which have such or such properties, but to point to specific extrinsic proper-

³³ There are various formulations (Nemo and Cadiot, 1997b, p. 23) of this commonsensical belief that “*Le sens d’une unité s’exprime par une définition, énonçant les propriétés qui sont requises d’un objet du monde pour qu’il constitue la référence actuelle d’une combinaison où entre l’unité en cause*” (The meaning of a unit may be expressed by a definition setting out the properties which an object of the world must possess in order for it to constitute the actual reference of a combination in which the this

ties (EP) independently of the nature of their carriers. Therefore, most of the time, the linguistic link which is postulated by Prototype Theory is indeed as virtual as the cognitive link may be indisputable: *client* may prototypically refer to a person in a shop, etc., and this may be of little or no importance to describe the semantic meaning of *client*.

As far as semantics is concerned (Cadiot and Nemo, 1997a, 1997b, 1997c), that is when there are linguistic traces of the existence of a prototype, what should be considered as an interesting problem would be the question of accounting for the existence of the prototype itself. This can be illustrated here with the behaviour of the proper noun *Asie* (Asia) and the corresponding adjective *asiatique*, and by comparing utterances such as:

- (9) (a) Le Pakistan, c'est déjà l'Asie. (Pakistan it's already Asia) *versus*
 (b) ?La Chine, c'est déjà l'Asie. (?China, it's already Asia)
- (10) (a) L'Asie me fascine. J'ai été trois fois au Japon. (Asia fascinates me. I went three times to Japan) *versus*
 (b) ??L'asie me fascine, j'ai été trois fois au Liban (??Asia fascinates me, I went three times to Lebanon)
- (11) (a) J'aimerais aller en Asie, surtout en Chine. (I would like to visit Asia, especially China) *versus*
 (b) ?J'aimerais aller en Asie, surtout au Liban. (?I would like to visit Asia, especially Lebanon)

we can observe that, despite belonging geographically to Asia, more than half of the continent is actually not what the words *Asie* or *asiatique* normally refer to. It seems thus that the contrast observed in the acceptability of (a) and (b) utterances is linked to a phenomenon of prototypicality: China, Thailand and Japan, somehow are not only more *asiatiques* than Yemen or Siberia, but often they are, with all their close neighbors, the only countries for whom the word *asiatique* can in fact be used. When one talks for instance of *asiatique* cooking, *asiatique* paintings or *asiatique* languages, what is actually referred to is exclusively to oriental cooking, oriental paintings, or oriental languages and not even – in French – to Indian cooking.

The explanation for this semantic reduction, as is explained in Cadiot and Nemo (1997c), is actually very interesting: what is quite clear indeed is that the properties or features which the two words refer to are simply not common properties of all the countries that belong to Asia, but **distinctive features or properties which singularize Asia from other continents**. The problem of Lebanon, as in (10b) and (11b) for instance, is that Lebanon is actually not so different – in terms of culture,

unit appears). (J.-C. Milner, 1978, p. 333). Radial accounts, such as G. Lakoff's account of *mother* (1987, p. 83) are loosening the constraint by showing that there are various properties which entitle somebody to be called a *mother*, but are keeping the "Who is an X?" framework.

religion, agriculture, populations – from non-Asiatic countries such as Egypt, Morocco or Georgia. In other words, the semantic content of *asiatique* or *Asie* does not include the CP (common properties) of whatever is in Asia, but only its DP (distinctive properties).

The very same thing, it must be noticed, could be said of the favorite examples of Prototype Theory: if the ostrich is an unprototypical bird, it is because it lacks the property which is the most distinctive of birds (in the human mind), i.e., the fact of flying. In other words, the prototypical members of a category appears to be those who are the most in contrast with the outside of the category. And hence, it must be recognized that what seems, as long as one considers only internal differences within a class, as matters of prototypicality and marginality (distance from the prototype), is, in fact, a matter of having or not the most important characteristics of a class. PP (prototypical properties) are such because they are first DP (distinctive features of a class). And, thus, prototypicality is not central to semantics.

It is hence possible to consider that prototypical designational cognitive evidence is either of no consequence to linguistics, and therefore may not be considered as the semantic content of words, or can be accounted for in terms of distinctive features which are both distinctive of a class and not common to all the members of a class, i.e., in terms of what we have called characteristics (Cadiot and Nemo, 1997c).

Taking into account DP – and sometimes, for instance in metaphorical utterances, DEP (Distinctive Extrinsic Properties) – is not a return to the structuralist sign to sign paradigm, simply because distinctive features are not opposition values within linguistic paradigms but interpretative features directly dependent on turn of phrases. This may be observed in all the utterances which convey implicit or explicit double characterizations, and among these, in tautological utterances.

5. Comparisons ...

5.1. ... and the interpretation of utterances

First (Cadiot and Nemo, 1997c), what we know is that:

- distinctive features (DP) are distinctive of the designata, and not of the signs themselves.
- distinctive features must not be shared by all the members of a class. (drumming is a distinctive features of woodpeckers, but many woodpeckers do not drum)
- the number of characteristics (distinctive features) of a class is not limited.
- sharing one of these characteristics is all that is needed for the use of a term.

But what is more, especially for the semantics/pragmatics interface, is that distinctive features are the results of a **process of comparison, and not of a process of representation or categorization**: to be the member of a class, an element must

have at least one of the characteristics of the class, which account for the extension of the class. But, as there are many different characteristics, **the problem of knowing which of them is referred to is a matter of context**, i.e., a matter of unifying the linguistic comparison set of elements which have to be distinguished one from another. In many cases, hence, words will be used as an index to point to distinctive properties (and to nothing else).

To illustrate the consequence of this for the semantics/pragmatics interface, we shall consider utterances such as:

- (12) C'est dimanche ou quoi? (Is it Sunday or what?)
- (13) Oh, dis donc, on n'est pas dimanche! (Hey, you, it's not Sunday!)
- (14) Paul, les vacances, y connaît pas! (Paul simply doesn't know what holidays are!)
- (15) Pierre n'a pas eu de père. (Peter has had no father)

In all those utterances, neither the question nor the assertions are actually interrogative or informative. So, in a way, the relevance of these utterances would be problematic if we wanted to consider that the meaning of *dimanche* is the designation of the seventh day of the week, or that *père* refers to biological paternity. Without considering here the relevance problem, nor the fact that in all those uses something and its negation may actually be true simultaneously (Peter does have a father but at the same time he has no father, Paul knows perfectly of the existence of Sundays but at the same time . . .), our problem here is to understand that in all those utterances, the semantic content of the words *dimanche*, *vacances* and *père* is not the common properties (CP) of Sundays, holidays or fathers, but the distinctive properties (DP) of Sundays, holidays and fathers: **the semantic content of a word is not a description of what it conventionally refers to, but a comparison of different things or states to isolate the specificities of something**. Hence, the utterance (12) may be used to ask "Why aren't you working?" or "Why are you so well dressed?", the utterance (13) may be used to remind somebody that he is not supposed to remain idle, (14) will be used to say that Paul never takes a rest and (15) will actually mean either that Peter has had limited or no contact with his dad, or that his dad has failed to fulfill his father's role correctly.

Examples of this kind, of course are very interesting for the study the semantics/pragmatics interface, especially when, as in (12) and (13), they concern indirect speech-acts or when the precise interpretation of all those utterances has to be explained. It shows, among other things that the nature of the information conveyed by such or such term is not actually independent of what is done when using the term, but also that what is being done is actually done a very specific way because of the words which are used: saying *C'est dimanche ou quoi?* (It's Sunday or what?) is not only asking somebody to go back to work (or to explain why (s)he is not working), it is reminding him (her) that there is a time to work and a time

not to work, and that they shouldn't be confused. The relation between pragmatics and semantics here is thus a matter of how what is done is done.

But what is more important in a way is the relation between the contextual potential of a term and its semantic content. First of all, in all contexts, the term actually refers to DP and EP (*dimanche* is not described in terms of the intrinsic properties of its designata, but in terms of the way people behave on those days). And because if DP are the result of a process of comparison, and not of a process of direct description, then the problem is to know whether the elements compared and opposed are independent of the context or not, or in simpler terms if in all contexts it is the same elements which are compared or not. The answer is clearly no: the "seventh day of the week after Saturday and before Monday" definition of *dimanche* is relevant only in contexts, which might be the most frequent, in which the Sunday must be distinguished from each of the other days. But in a use of *dimanche*, such as the one observed in (12) or (13), Sundays are opposed to the rest of the week as a whole. Leading for instance to a "time to rest/time to work" opposition.

From a more general perspective, what does all this mean, or show? Simply, that **a word can be used to refer to anything, as soon as it locally has a sufficient discriminative capacity**, but also, and hence, **that its semantic content will depend on the discriminative scene**. If this is the case, it is mainly because semantic interpretation, in the Récanati (1989) sense, appears to be the result of the unification process of two parallel comparisons. Thus, in a given situation, in which there are very few elements involved, the discriminative capacity of words actually **increases**. The relation between words and context may therefore be understood in a completely new way: the problem is not that interpretation is a matter of context, and that this interpretation would be the result of the encounter of a semantic content and a complex set of contextual elements, the reality is that words or expressions may designate almost any kind of realities because contexts are actually extremely simple. If words' distinctive values cannot be defined inside language structure, it is simply because their distinctive value is context-dependent. Words' designation function, a function which is not semiotically inherent in the words themselves, is highly context-dependent, because it cannot be considered apart from the words' discriminative function, and because discrimination cannot be understood without considering the elements to be set apart. Which implies, finally, that designation exists only within a comparison process, and through the contextual determination of the elements involved (the contrastive set). This could be shown with metaphorical utterances, but we shall, rather, focus on tautologies.

5.2. ... and the interpretation of tautologies (and explicit double characterizations)

The study of tautological utterances is an interesting field for both semantics and pragmatics.

It is interesting for semantics because it is not so easy to account for the actual semantic interpretation of such utterances (Wierzbicka, 1991, pp. 391–451), which is hardly linkable with the so-called propositional content or logical form that could be expected to be the fundamental meaning of the sentence.

It is also very interesting for pragmatics because those utterances seem at first sight to be irrelevant ones, which should be of considerable interest for the study of relevance. However, the semantics of tautologies remains today purely descriptive and, after twenty years of considerable focus on relevance, we still have almost nothing to say which would account for the relevance of such utterances.

However, the fact that neither semantics nor pragmatics could actually fully account for such utterances has something to do with our way of understanding the semantics/pragmatics interface: tautological utterances, among others, actually falsify the idea that there would be what is said on one side (the explicature) and what is inferred from what is said on the other side (the implicatures).³⁴ As a matter of fact, it seems clear from such examples that accounting for the meaning of what is said and accounting for the relevance of what is said is exactly the same task.

Let us consider first apparently tautological utterances such as:

- (16) On est Alsacien ou on ne l'est pas. (One is Alsatian or not.)

As soon as (16) is interpreted as a **representation**, it is tautological one, because saying *P* or not-*P* is always true. But, if we consider that utterances are **comparisons**, and not representations, then the semantic meaning of (16) may be obtained directly: (16) refers to the difference it makes to be Alsatian or not, as far as something is concerned. Therefore, (16) is normally used to point to a DP of Alsations (compared implicitly to other French people), such as drinking a lot of beer, in order for instance to present as normal such or such an attitude. It must be noticed that what is observed here in a tautological utterance is not specific to tautological utterances. The semantic interpretation of utterances such as (17):

- (17) Les Alsaciens boivent de la bière. (Alsations drink beer.)

is a problem too, first because it is not necessary that all Alsations actually drink beer, and second because of the fact that *boivent de la bière* (drink beer) must be interpreted as *boivent beaucoup de bière* (drink a lot of beer). However, once again, it is clear that as soon as (17) is not treated as a representation but as a comparison, all those semantic difficulties disappear.

An observation which is even more apparent in the example (18):

- (18) Nadia_i n'est pas sa_i sœur. (Nadia_i is not her_i sister)

³⁴ As A. Wierzbicka remarks (1991, p. 400), despite Levinson's agreement (1983, pp. 110–111) about the fact that "exactly how the appropriate implicatures in these cases are to be predicated remains unclear", "context" appears to be "an excuse for analytical failure".

because what could appear to be a self evident representation if it was a representation, is in fact a comparison of Nadia and her sister. Once again, the problem representational semantics is facing here is that the hypothesis that sentences or utterances are representations leads us to describe in only one dimension what is in reality bidimensional.

The comparison versus representation thesis that we shall support as a starting point to understand tautological utterances also apply to all utterances of the form *Det N est Det N* (Det N is Det N), tautological double characterizations being precisely of the form *Det1 N1 est Det1 N1* (Det1 N1 is Det1 N1), but also to utterances of the forms *Det1 N1 est Det2 N1* (Det1 N1 is Det2 N1), or to paradoxal utterances of the *Det1 N1 n'est pas Det2 N1* (Det1 N1 is not Det2 N1) form.

For all this last kind of utterances, it must be remarked first that they escape the excluded middle constraint: things may be N and not-N at the same time, a situation which may be called the included middle.³⁵

- (19) Mes vacances n'ont pas été des vacances. (My holidays were no holidays)
- (20) Ses vacances n'en ont pas été. (His holidays just were not holidays)
- (21) Son père n'était pas un père. (His (Her) dad was not a dad).

Therefore, it is easy to understand that the relevance of tautological or paradoxical utterances is linked to the existence of this internal negation, which leaves many linguistic traces, for instance hedges:

- (22) La guerre est la guerre. (War is war)
- (23) La guerre n'est pas toujours la guerre (War is not always war)
- (24) Cette année, j'ai pris des vraies vacances (This year, I took real vacations)

Hence, tautological and paradoxal utterances may be described as double comparisons: they both mobilize the DP of a class on one hand – the fact of not working for holidays for instance – and in the same time they either advance that no difference should be expected between the members of the class (about those DP) or on the contrary advance that a difference should be made!³⁶

³⁵ As could be observed already with the adjective *asiatique*, some countries being both *asiatiques* and not.

³⁶ A case which can be found in Chinese 'concessive' tautologies, for which, according to A. Wierzbicka (1991, p. 423), "*The subordinate clause states an 'undeniable truth' but the main clause contradicts this truth with respect to a specific instance: since this particular entity (X) belongs to a certain kind, one might expect that it will have certain properties, generally seen as characteristic of that kind: and yet, the speakers point out, this particular X (X_i) doesn't have the properties in question*". But this must be considered together with all the numerous cases for which it is the existence of the necessity to make a difference which is stated: it might be the case that there are culture-specific interpretations of such or such formula, but the semantic content of these formulas seems to be potentially universal.

The utterance (22) would be a good example of the first case, as utterance (25):

(25) Une voiture est une voiture (a car is a car)

which is used most of the time to say that all cars are the same, that *il n'y a pas voiture et voiture* (there is no car and car). It seems, nevertheless, that contrasting (25) with the utterances (22) and (26):

(26) Boys will be boys (les garçons seront toujours des garçons)

leads to observe the presence of an *X*-dependency feature³⁷ in utterances (22) and (26), as they both convey the idea that “there is nothing anybody can do about it”, a feature which is not present in all tautologies, although being present, as we shall see later on, in all kinds of utterances. The utterance (25) on the contrary may perfectly well be used as an answer to a question of the form *Do you want this or that car model?* to assert that it makes no difference to him (her).

With (25), it must be noticed, it is not the DP of the class which are focused on (the fact that wars are cruel or that boys are unruly), but what may distinguish cars one from another (being big, comfortable or fast) and thus properties which are neither common nor distinctive.

If we consider finally examples such as (27):

(27) Lui, c'est lui, moi, c'est moi. (He is he, I am I)

it is clear first that it is the necessity not to consider two people as one single entity³⁸ which is at stake here, but also that ‘considering’ two people as one entity concerns one’s **attitude** toward those people, and hence EP, and not any IP.

What is at stake in tautological utterances is the necessity or not to make a distinction between things of the same type or which belong together.

As regards finally the pragmatic or contextual dimension of the interpretation of such utterances, it appears to be important but very limited: in some contexts – i.e., in contexts where a difference has been made – tautological utterances will be used to remind us that no difference should be made, while in other contexts – i.e., in contexts where no difference has been, or could, be made – tautological utterances will be used to insist on the necessity for things to be kept separated, and neither altered nor confused.³⁹ The contextual dimension of these utterances is hence undisputable but limited to the determination of which of the two possible interpretations will be contextually valid.

³⁷ For an explanation of this feature, see Sections 7.3 and 7.4.

³⁸ A. Wierzbicka's (1991, p. 431) example of the (Chinese) statement that “husband is husband”, in a situation in which what is at stake is the way a group of housewives should behave with Mrs Tanaka, whose husband has just been gaoled, works the same way: it points to relationships with people, and insists on the necessity not to consider them as ‘going together’.

³⁹ As for instance the Chinese tautologies of irreducible difference (Wierzbicka, 1991, p. 427).

It is of course impossible to cover here all the variety of tautological utterances and all the semantics of characteristics, but it must be noticed once again that these utterances are only a special case of double characterizations, i.e., of utterances such as:

(28) Ce chien est un chat. (This dog is a cat.)

(29) Ce doberman est un doberman. (This doberman is a doberman.)

whose interpretation actually follow the same patterns (Cadiot and Nemo, 1997c).

Thus, the (implicit) comparison process which all these utterances convey appears to be another example of the fact that utterances, even when they are constative, are better analyzed as comparisons than as representations.

Therefore, it is not only the semanticists' tendency to describe words in designational terms which should be considered with the greatest caution, but also their tendency to assume sentence meaning to be representational which appears to be very frail: if utterances are (implicit) comparisons, then it is clear that all attempts to give them purely representational descriptions is as hopeless as attempts of describing bidimensional objects in a strictly unidimensional space would be.

6. Semantic levels

If we leave the question of knowing what kind of semantic information is attached to linguistic units, to reverse it in order to know what are the linguistic units which carry semantic information, it becomes possible to understand why the semantic information conveyed by first-level semantic units is not representational, but procedural or indexical, formed not of descriptions but of instructions or indications.

But to understand why such a simple point of view, namely that the morphemes *table* or *part*, for instance, or the French prefix *re-* or suffix *-ier*, carry indications which are independent of the grammatical and designational categories of the words which are formed with them, has not been seriously considered – and why, consequently the semantics of morphemes is in such a state of infancy – we must give up the temptation to consider the idea that nouns, verbs (or even adjectives), because they are designational units (symbols), should be considered as the starting points of any semantic analysis: *table* is not basically a noun, it only becomes so when it appears in a nominal syntagm such as *la table*, and it is only because of this syntagmatic information that it becomes a designational unit.

Within such a heuristic perspective, four hypothesis would as a matter of fact deserved to be tested:

- 1 – The deepest semantic level, that is the morphemic level, is free of syntagmatic interpretation and of designational function;
- 2 – Morphemic information is indicative, i.e., it indicates **that there is this or that** and not designational, i.e., it does not provide information about **what** is what it points to;

- 3 – Designation is a phenomenon which requires both morphemic indications and syntagmatic information, not to mention contextual unification;
- 4 – Figurative uses of linguistic expressions are uses which are only indicational, and not designational.

In other words, and in that view, designation is an illusion when, at it has always been the case, it is believed to be the basic and fundamental semantic level. And on the contrary, it must be understood that designation is a reality which cannot be observed at lower semantic levels than syntagms.

6.1. *The semantics of morphemes*

But what does all this mean exactly? And why should such an hypothesis be considered?

First of all, because we have no reason to believe that nouns or verbs should be more basic semantic units than morphemes. And no reason to follow componential analysis when it takes for granted that words should be decomposed and decomposable in smaller units, and not the other way round, and that therefore the designational nature of words (lexemes) should be imposed on the deepest semantic levels and units.

Why indeed should we consider for instance that despite the fact that in the verb *tablér* – in the nouns *table*, *tableau*, *tablette*, *établi*, in the nominal syntagms *table de multiplication*, *table à langer*, or in verbal syntagms such as *se mettre à table* (to display all the information one has) etc. the morpheme *table* gives the same kind of indications – the word *table* is fundamentally designating a certain kind of object, leading thus to consider that the meaning of the morpheme *table* and the (prototypical) meaning of *une table* (a table) should be the same?

And why should this clearly unrealistic, although commonsensical, hypothesis be maintained when it has so far led semantics to ignore almost completely the existence and meaning of morphemes.

The second reason to consider this hypothesis is that focusing on designation is by itself a condemnation of semantics, as will be clearly illustrated by the next few examples.

To start with the most simple example, we shall consider the word *désert* (desert): if we had to consider that *désert* basically designates a certain kind of thing, and worse if we believed that its prototypical designation is a hot and sandy place, we would have first to account for the existence of *déserts glacés* (frozen deserts), *déserts sous-marins* (submarine deserts), and then to account for (supposedly) metaphorical uses of the noun, such as *Paris et le désert français* (Paris and the French desert), or idioms such as *Il a fait le désert autour de lui* (He has created a desert around him), not to mention the verb *désérer* (to desert, deserted). Though, there is no doubt in fact that the meaning of the morpheme *désert* is much more apparent in the adjective: to be *désert*, is to be inhabited, and what the

morpheme *désert* indicates is that *il n'y a personne* (there is no human or living beings), or *il n'y a rien* (there is nothing).

Therefore, it is clear that the fact of being hot and to have no vegetation is not a part of the semantic content of *désert*: it is only a matter of fact that, exactly as the coldest parts of our planet, *déserts* such as Sahara are actually *déserts* (adjective), i.e., places with no human (or non-human) life. Hence, *Paris et le désert français*, is simply not a metaphor, i.e., a transfer of designation, it just means that there is no life in France out of Paris, or that it might be the case soon.

The same could be said of a morpheme like *part*, which can be found in words such as the nouns *part* (part), *partage* (sharing), *participation*, *parti* (party), but also in verbs such as *partir* (to go, to leave), *participer* (participate). As always, the most revealing examples of the nature of the indication given by a morpheme are apparently marginal examples: the fact that *particule* (particle) can be used to designate the *de* of aristocratic names such as *Nicolas de Staël*, the fact that a woman giving birth is called a *parturiente* (parturient), the fact that expressions like *Il ne se départait jamais d'un sourire ironique* (He never lost his ironical smile), the fact, finally, that in other languages such as Spanish or English, the meaning of the morphemes shows great stability (the Spanish verb *partir* means to cut into pieces, the English *parser* to analyze) . . . all this clearly shows that the indication which is given is the existence of something which is coming together (initially) and (then) separated.⁴⁰

E. Benveniste's expert advice (1969) is consequently worth following, when he was saying about the vocabulary of the Indo-European institutions that one has to look "*au-delà des désignations, qui sont souvent très divergentes, à atteindre le niveau profond des significations qui les fondent [. . .]*" (beyond the designations, which are often divergent, in order to reach the deepest semantics of the significations which explains them).

Other well studied examples may illustrate with even greater clarity the nature of the problem which must be avoided. If one considers the semantics of suffixes and prefixes, such as the prefix *re-* in French or the suffix *-ier*, it is easy to observe the consequence of not establishing a clear-cut distinction between the indications which the morpheme encodes and the information which is given by the designational status of the lexeme/syntagm.

To show it, we shall consider first the morpheme *-ier*, one of the most productive suffixes of the French language. It is used in most names of fruit-trees or fruit-plants, for many profession's names (*banquier*, *serrurier*, etc.), for transportation devices, and, as a matter of fact, for almost all kind of things (with lower lexical productivity). Thus, it is clear that there is nothing that all the objects with

⁴⁰ The semantic closeness of the morpheme *part* and *pièce* is remarkable, but indicates opposite 'directions': from separation to functional togetherness for the latter, from togetherness to functional separation for the former, as is clearly shown by the comparison of *appartement* (flat) and *quatre-pièces* (Four-roomed flat).

a *X+ier* name have in common, and nothing that their definition would have in common either.

Hence, all attempts to understand the semantic content of this suffix with the designational equation above must fail (without the equation itself being ever falsified):

$$\begin{array}{ccccc} \text{Base} & + & \text{Suffix} & = & \text{Lexeme} \\ | & & | & & | \\ \text{D1} & & \text{D2} & & \text{D3} \end{array}$$

because it is impossible to find either what all the D3 would have in common, or what all the D1 would have in common, and finally to spell out what could be D2, even, on individual examples, by using our knowledge of what D3 and D1 actually are.

But as soon as it is supposed on the contrary that what is coded by the suffix is not an information about the referent but only a way to get access to the referent, then a semantic description becomes possible. In fact (Nemo and Cadiot, 1997b), the morpheme *-ier* gives **prepositional** indications about the relationship between *X* and *Xier* and not at all about the designata of *Xier*. The instruction to follow being to find either a verb of action *V* for which “*Xs V par Xier*” or a ‘static’ verb for which “*Xs V dans/sur Xier*”.

Thus, *-ier* in the word *chatière* (catflap) allows access to *chats passent par chatière* (cats go through *chatière*), *clocher* (steeple or bell-tower) to *cloches suspendues dans clocher* (Bells hanged in *clocher*), *sorcière* (witch) to *sorts jetés par sorcière* (curses put by *sorcière*), etc. But for now the only important issue about this example is that it shows the necessity to distinguish between what is encoded and what is kept in lexical memory: it is obvious that the first time a word in *-ier* is heard, its meaning has to be determined, and that the indications given by *-ier* (the plural *s* of *Xs*, the indeterminacy of the verb, the nature of the preposition concerned) serve as guidelines for its interpretation. For instance, the neologism *exemplier* (hand-out) will be interpreted through the formula *exemples donnés par/sur exemplier* (examples given by/on *exemplier*). But then, once *exemplier*'s designation is determined, it will be kept in lexical memory once and for all.

The semantic content of such a suffix is hence not about the designata – it doesn't tell what the designata are, which explains why it can be used for all kinds of things – but about the relation between the *Xs* and the *X + suffix*, and its semiotic nature is therefore not symbolic but strictly indexical.

If we consider now the prefix *re-*, it may similarly sound commonsensical, when it is a proverb, to believe that *re-* is giving information about the process which the verb designates, the only problem being to describe the nature of the information provided. In Franckel's recent work (1997, pp. 60–61) on this prefix for instance, it is taken for granted – as is apparent in the the formulation itself – that describing

re- implies to describe what the processes the [*re-* + verb] verbs designate have in common:

Un procès préfixé par RE- marque la construction d'une occurrence de procès à partir de deux positions qui s'articulent l'une à l'autre dans un double mouvement complémentaire:

- *une position de référence (notée I), définie et stabilisée indépendamment de cette construction;*
- *une position qui mène à I et dont la détermination qualitative non stabilisée dérive de I (elle est en deçà d'une démarcation stabilisée entre I et E).*

(A process prefixed by RE- marks the construction of an occurrence of process, on the basis of two positions which are related one to the other within a double and complementary movement:

- a position of reference (noted I), defined and stable independently of this construction;
- a position which leads to I and whose unstable qualitative determination is derived from I.)

Once again, we may observe that the information attached to *re-* (D2) is here believed to be an information about D3 (the process *re*-verb designates).

$$\begin{array}{ccccc}
 \text{Prefix} & + & \text{Base} & = & \text{Lexeme} \\
 | & & | & & | \\
 \text{D2} & & \text{D1} & & \text{D3}
 \end{array}$$

the definition, thus, mixes the information *re-* encodes with information from other components and position: the verbal status of [*re-* + verb] lexemes does indicate that what the lexeme designates is a process, and, as we know that a process has a start and an end, hence, it is all too logical to consider that *re-* should bring information about the starting or finishing position, or about the nature of the process itself.

The only problem with this lexematic bias is that it greatly complicates the description of the data – five categories of uses are described, three of them splitting into subcategories – and makes it impossible to isolate what *re-* actually indicates:

The presence of *re-* indicates that two distinct and opposed (sometimes contradicting⁴¹) processes have been (or are) going on, and that the (often verbal) form following *re-* is giving indications about the second process.

⁴¹ Contradicting or opposed processes in that sense that the second process somehow reverses the first movement. The email use (re: how are you?) is evidence of this double 'direction', but the composition differs because the 'base' is the first process and not the second one.

Hence, *re-* itself just does not specify the latter process: what happens is exactly the opposite, it is the 'base' which specifies the second process *re-* is referring to.

Let us illustrate this with the two examples of *retenir* (to keep, to hold back, to remember) and *repousser* (to push back, to spurn, to dismiss): what *re-* indicates in both cases is that there was a first process (leaving or advancing toward somebody) – involving often, it must be noticed,⁴² somebody else than the person performing the second action – and that a second process follows (holding back, pushing back) which somehow is opposed to the first one. Similarly, what *rester* (to stay) indicates to us, is for instance that somebody who considered the possibility of leaving is not leaving. In a way, it is correct to say that *re-* in *re-* + verb compositions indicates the context of an action. Hence *re-* iterative interpretation is not the basic nor the first meaning⁴³ – nor would be a designation like *en arrière* (backward) – despite being the most spontaneous account of the meaning of the prefix, but a special case for which the first and second processes are of the same nature.

In any case, what appears is this: the morphemic (encoded) indications are free of syntagmatic constraints, and therefore there is no reason to believe that the lexemic or syntagmatic level should be considered as basic, in the opposite, it must be analyzed as an intermediate semantic level, which integrates the morphemes's indications and structural and syntagmatic information.

6.2. Indicational meaning, context and interpretation

But why should all this be of any interest for the definition of semantics and the understanding of the semantics/pragmatics interface? For two main reasons.

The first one is that the opposition of meaning and interpretation, code and inference, must not be considered as satisfactory:

(1) it seems likely that linguistic units actually carry two types of information, indexical/indicational and symbolic/designational information.

(2) it seems also that indexical information is much more stable than designational information, and that the former is probably the encoded part of semantic

⁴² It is remarkable that the most distinctive feature to classify the verbs prefixed by *re-*, which is the question of knowing who is actually performing each of the two processes – *réagir* (to react) versus *revenir* (to come back) – is not even mentioned in Franckel's otherwise subtle analysis: as long as one takes for granted that only one process is going on, the question is in effect meaningless.

⁴³ It is clear that *re-* cannot be used to indicate the mere repetition of an action, as it requires a gap between the normal end of the first process and of the start of the second: *recommencer* (to start again) may mean either that something was stopped (*Il a recommencé à respirer*, He started breathing again) or that a first process was stopped to start the second one. The other way round, it is just impossible to use *re-* for most recurrent actions. For instance, one cannot say *J'ai repetit déjeuné* (I had breakfast again) to refer to daily breakfast, the two breakfast must be on the same day or morning, and the second one is presented as anomalous (compared to *J'ai petit déjeuné deux fois* (I had breakfast twice) in which it is not the case).

content meanwhile the latter is probably only kept in lexical memory, if not only contextually available.

(3) it seems finally that language use is not limited to (or by) designational content, but relies heavily on the indexical/indicational dimensions of linguistic units.

The second one is that the indexical dimensions of signs completely changes the way the relation between sentences and context must be viewed. The fact that *repasser* may be used for such different things as ironing, taking an exam again, putting somebody back to the switchboard, passing a virus on, going past again, the fact that *revenir* may be used for such different things as coming back or returning, costing and going back over something, falling to somebody or reaching somebody's ears, is not a matter of polysemy at all: it is a matter of the encounter between some very limited and invariable indications and specific contexts in which these indications will receive specific interpretations. For instance, it is fairly common to say *Je reviens* (I'll be back) or *Je repasse* (I'll be back) in order to communicate that one is leaving, or finally not staying: in such a case, the first process is not past but present and the second process is not in the present but in the future, as is marked (only) in the English translation.

Interpretation, hence, may be described as a process of unification of semantic indications and contextual elements.

This assessment of the indexical nature of signs (morphemes) should not be confused with any assessment of the indexical nature of language, such as those made by Garfinkel (1967) or Garfinkel and Sacks (1970). The problem is not that natural language would be inherently indexical and that we should therefore "*drop the assumption*" (Garfinkel, 1967, p. 28) of a sign-referent correspondence, but that sign's 'meaning' itself consists on indications and not on designations: the indexicality of language itself should be viewed as a consequence of the indexical nature of morphemes, and there is no contradiction, except for those who confuse semantic meaning with actual designation, to say both that semantic meaning is extremely rigid and that the indications it provides must be unified with contextual elements in order to understand what exactly is said in the context.

But this, of course, greatly deserves to be proved by and through concrete descriptions.

6.3. Adverbs and discourse 'connectives': indications and functions

To show how far this indexical semantic inflexibility may combine with the most diverse interpretations I shall consider two French adverbs which may be used as discourse connectives: *enfin* (at last, finally) and *toujours* (always, still). Both have received detailed attention and descriptions (Cadiot et al., 1985a, 1985b;

Ducrot et al., 1986; Nguyen, 1986), which will allow us to be sure that the test takes into account most of the actual uses of both terms, and especially the most problematic ones.

Two problems are of direct interest for the study of the semantic/pragmatic interface:

(1) the semantic difference between the adverbial uses and the connective uses.

(2) the diversity of functions and roles each of them may have and play as discourse connectives.

To consider a small but complete set of uses of *enfin*, we shall consider the following examples:

(30) Il a pris son chapeau, sa canne, a vérifié sa sacoche et est enfin sorti.

(He took his hat, his cane, checked his bag and finally left)

(31) Enfin! Voulez vous bien vous taire!!

(For Heaven's sake! Would you shut up!)

(32) Paul, enfin, réapparut!

(Paul at last, reappeared!)

(33) Il a fait un bon travail, enfin, je suis satisfait de lui.

(He did a good job, 'in short', I'm satisfied with him.)

(34) C'est n'importe quoi. Enfin! On va essayer de se débrouiller.

(This is pure nonsense! 'Anyway'! We'll manage to do with it.)

(35) Il a hésité un peu, enfin, en vérité beaucoup.

(He had a small hesitation, well, to be honest, a big one.)

(36) Il n'en est pas question, enfin, je ne vous ai rien dit.

(This is out of question, well, I didn't tell you anything.)

(37) Les oiseaux, enfin, apparaissent il y a cinquante millions d'années.

(Birds, finally, appeared 50 millions years ago.)

(38) Tu prendras à droite, enfin, à gauche.

(Take to the right, I mean, to the left.)

The problem with these examples is that *enfin*'s function is different in almost each of them. And thus to know what semantic or pragmatic continuity could be established between the exasperation value of (31), the 'let's forget it' value of (34), the corrective value of (38) and the relief value of (32), etc ... In that last respect, neither the topic closing value (37), nor the discursive value (Cadiot et al., 1985a), nor the reformulative value (Rossari, 1994, pp. 26–47), may be considered prototypical or central values: they are all frequent uses of *enfin*, but no hierarchy between them may be considered as a legitimate one, as it would be clearly arbitrary.

Nevertheless, and far more interestingly for the semantics/pragmatics interface, the morpheme *enfin* appears to convey only two indications:

- **it indicates that there is (or was) something unsatisfactory in the first place.**
- **it indicates that this dissatisfaction is somehow given a (positive) term.**

Hence, the difference that exists between the uses is actually a matter of what (and when) is the source of dissatisfaction and of what leads to end positively this unsatisfactory reality (and when). If we consider t_0 to be the moment in which *enfin* is uttered, then it is possible to observe that:

- in the relief use of *enfin*, the unsatisfactory or painful situation is at a time t_{-2} and the (relieving) end of this situation is a time t_{-1} very close to t_0 or even in t_0 itself. Hence, the interpretation of the indications is each time constative.
- in the exasperation use, the unsatisfactory or painful situation is at time t_0 and the (relieving) end of this present and disagreeable situation is a time t_{+1} , that is in the immediate future. Hence, such a use of *enfin* is actually directive, as it both expresses dissatisfaction with the present situation and demands to make this situation stop.
- in the 'let's forget it!' use, the unsatisfactory situation may be past or present but it is the uttering of *enfin* which is closing the expression of dissatisfaction: this use is hence fully performative and auto-referential, as it permits a verbal ending of dissatisfaction.
- in the resignation use (He will never make it, *enfin!*), which may concern a future event, the term given is the fact of not talking about it any more.

Similarly, metacommunicational uses, such as corrective or reformulative uses, can be understood from the same indications:

- in corrective uses, such as (38), it is simply the first formulation which is wrong and the second which is actually correcting it.
- in reformulative uses, such as (35) or (33), it is the first formulation which is not fully satisfactory and the second which is better.
- in uses, such as (36), it is a fact of saying something which is considered a potential problem, and *enfin* introduces once again a purely performative (and counterfactual) utterance (I didn't tell you anything).
- in uses such as *Ce serait sympa d'y aller. Enfin, tu fais ce que tu veux* (It would be nice to go and see him, *enfin*, you do what you want), it is the first utterance (too important) directiveness which is presented as a potential problem and has

to be somehow softened to rejoin what Leech (1983) called the optionality of the action concerned.

Finally, and this description may be applied to this *finally*, the topic closing value of *enfin*, may be accounted for by the following interpretation:

- that what is preceding would not be complete (and hence satisfactory) without what is coming next (which is giving a satisfactory ending to the contribution).
- Concerning the descriptive/narrative uses of *enfin*, or more correctly of *et enfin*, such as (30), three things must be remarked:
- what is done in the first place (to take the hat, then to take the cane, then to check one's bag) cannot be separated from its normal ending (to leave).
 - the dramatisation (through slow motion analyticity) of the process indicates that until the process was actually completed, the fact that it would was a source of tension.

In other words, the specificity of the narrative use is that it doesn't relate two processes or situations but the preliminary and final steps of a single process. But still within a context in which the ending of the process is considered as positive and necessary, and its progress a source of tension.

Hence, exactly the same way, the meanings of linguistic units cannot be identified with the (denominative) designation of these terms, the meaning of discourse words cannot be identified in terms of what they do (Fraser, 1996), and hence in terms of speech acts⁴⁴ its function or role. Connective functions are no more inherent to discourse words as designation to ordinary morphemes and it is clear that distinguishing different *enfin* would be pointless: the indications *enfin* provides are always the same indications, they just point to quite different realities, some being extra-linguistic while others are purely discursive ones.

But it is not only the uses of *enfin* in connective positions which the semantic identity account for, but purely adverbial uses of the morpheme (i.e., uses of the morpheme in adverbial positions) too, as may be observed in an utterance such as *Il a enfin fait preuve de courage* (He finally showed proof of courage), in which the same indications are found:⁴⁵ dissatisfaction leaves room for satisfaction even if it came later than expected or desired.

Let us give another example of this semantic continuity between adverbial and connective uses with the morpheme *toujours* (always, still), whose 'semantic' (i.e., adverbial and designational) and 'pragmatic' (i.e., connective and functional) uses have so far always been separated (Cadiot et al., 1985b; Ducrot et al., 1986; Nguyen, 1986), turning this morpheme into a very interesting example of the existence or the nonexistence of something like an interface between the two dimensions. We shall thus consider the following examples:

⁴⁴ It is beyond doubt that the study of discourse connectives leads to reconsider completely the typology of speech acts pragmatics must take into account. In that sense, this field constitutes a bridge between a renewed and deeper understanding of speech acts and a deeper understanding of relevance.

⁴⁵ The first indication, instead of pointing to a given situation, is building it up in a presuppositional context.

- (39) Pierre est toujours là.
(Peter is still here.)
- (40) Pierre vient toujours à cinq heures.
(Peter always comes at 5.)
- (41) Toujours à Lyon, deux concerts de reggae le 23 et 24.
(Still in Lyon, two reggae concerts on the 23rd and 24th)
- (42) Allons au café! On y sera toujours au chaud?
(Let's go to the pub! It shall be warm in there 'at least'.)
- (43) Cause toujours!
(Speak as much as you want!!)
- (44) Ecris toujours! On ne sait jamais!
(Do write always, who knows?)
- (45) – Est-ce que je peux avoir mon dessert?
– Mange toujours ta soupe!
(– May I have my dessert?
– Eat your soup 'anyway')
- (46) – On ne vas pas sortir, regarde cette pluie! (We shouldn't go out, look how it rains!)
– C'est comme tu voudras, toujours est-il que tu es bien sorti l'autre jour par une pluie battante.
(As you wish, 'the fact remains' that you did go out the other day under heavy rain.)

which represents most uses of the morpheme *toujours*. If examples (39)–(46) may be grouped as marking somehow the continuity of a process or a state of affairs – temporal continuity, temporal repetition, spatial/topical continuity – the other uses seem not only free of the supposedly basic or prototypical meaning of temporal continuity of *toujours*, but also quite difficult to simply paraphrase or relate to any specific speech act.

What *toujours* indicates however, in all these utterances, is indeed and simply that:

something makes no difference ($\Delta = 0$).

Hence, in our examples, this indication leads to the following interpretations:

- in (46), the *toujours* of *toujours est-il* is a reaction to the initial assertion that rain would be a reason not to go out, by pointing to the fact that, another day, the fact that it was raining or not was apparently making no difference whatsoever for the first speaker.⁴⁶
- in (45), *toujours* indicates that finishing the soup might make no difference as far as getting the dessert is concerned. In other terms, and compared to *Mange ta soupe d'abord* (Eat your soup first), using *toujours* is a way to indicate (and probably pretend) that even finishing the soup, it is not sure the answer will be yes).
- in (44), the combination of *toujours* and the imperative form (and advice force) leads to say on one hand that writing will probably give no result and make no difference, and on the other hand that despite that, it might be worth writing, as nobody knows what may happen.
- in (43), the indication is straightforward: speak as much as you want, it will make strictly no difference.
- in (42), what *toujours* indicates is that although it makes no difference to go to the pub for whatever was in question (going to the pub is not a solution to the problem which had to be solved), at least the pub being warm, it will make a difference on another count.
- in (41), what *toujours* indicates is very simply that if the speaker does announce something different from what was preceding, there is no difference as far as **where** the events are taking place is concerned.
- in (40), the only change is that it says that there are no difference from one day to another in Peter's behaviour.
- in (39), finally, the indicative nature of semantic meaning is even easier to observe, as *Pierre est toujours là* (Peter is still here) means both that *Pierre est là* (Peter is here), and that it changes nothing (as Peter was also here before). In other words, *toujours* is providing here the information $\Delta = 0$, and as its adverbial median position (Ducrot et al., 1986) indicates that this indication is relative to the predicate, it allows for the reconstruction of the fact that before t_0 Peter was there and hence of the interpretation of temporal continuity.

Hence, there is clearly a semantic indicational continuity between the 'semantic' adverbial uses of *toujours* and its so called 'pragmatic' uses. And nothing like the ever-looked-after designational continuity which would link all the uses of *toujours* with the 'primitive' temporal meaning.

The use of morphemes, once again, seems to obey only a constraint of unification of the sign's semantic indications, which are encoded, with contextual elements, of very different nature as could be observed.

⁴⁶ Generally speaking, the use of *toujours est-il* indicates that what is preceding does not preclude what is coming next.

As regards the semantics/pragmatics interface, this result is quite important: if early pragmatics, i.e., pre-Austinian pragmatics, was deeply concerned with understanding signs' use, later pragmatic paradigms have almost forgotten this issue. As a large part of the interpretation of utterances is dependent on morphemes indications, as was extensively shown here – a phenomenon which has nothing to do with the context-free conception of meaning which has sometimes be hypothesized, – it is quite clear that this has lead to a conception of pragmatics which greatly overestimates the role of cognitive pragmatic mechanisms in the interpretation of utterances.⁴⁷

But apart from this important result, it must also be noticed that if the semantic content of *enfin* and *toujours* is not designational/representational, it is because it is comparational: both morphemes' semantic content is comparational, either because it contrasts an unsatisfactory situation with satisfactory one, or because it simply points to the result of a comparison process to state that there is no difference between the two situations compared.

Moreover, if we consider the study of these morphemes in relation to all the phenomena analyzed before (such as tautological utterances for instance), it is possible to reach a double conclusion:

- there are actually three different semantic levels, the morphemic/indicational level, the syntagmatic/designational level, and the utterantial/comparational level. In other words, the classical word/designation and proposition/representation levels of modern semantics should be abandoned.
- while the semiotic nature of morphemes is clearly indicational, the semantic content of many morphemes is actually comparational, i.e., directly related to pragmatic constraints on relevance. In other words, Benveniste's assertion (1974, p. 134) that "*Nihil est in lingua quod non prius fuerit in oratione*" (Nothing is in language structure that was not primarily in speech) is finding here, in the study of discourse morphemes, a new backing.

These two conclusions make it actually necessary to leave now our study of the pragmatics of signs to start considering extensively the semantics of relevance, i.e., the semantic study of utterances and contributions.

7. The semantics of relevance

Taking the question of relevance seriously, in other words considering it as important as the question of meaning, and even more important if one considers that this second question cannot be answered without answering the first, is probably

⁴⁷ No matter how important these mechanisms actually are, as we shall see right away, they both cannot account for language and a sign's use in general, and are misleading for the two disciplines, allowing the survival of the traditional designational account of semantics on one hand, and forcing pragmatics to adopt principles that are fuzzy enough to account for any possible problem of interpretation, even when these problems requires indicational and comparational explanations.

the most important advance for pragmatics in the study of language since Austin's work on performativity. However, within pragmatics, the issue is not so simple, mainly because of the reductionist temptation to bring pragmatics down to the sole celebration of relevance, to which many authors have given in to (Moeschler and Reboul, 1994). Yet, the first step in the admission of the importance of relevance came quite early, i.e., since at least the middle of the nineteen fifties,⁴⁸ in terms which were later developed in a coherent framework by P. Grice:

Someone who wants to prick up our ears consequently tries to avoid saying things which do not tie up with our concerns. Therefore there is a tacit convention that a speaker ought to say things relevant to the addressee. This principle of relevance (to the addressee) may be formulated in the following way: 'Never say anything that cannot be expected to interest your addressee; and when you have started on a topic, don't omit parts that are important to him.' (M. Furberg, 1963 [1971], p. 93)

It took some time for a relation to be established between this principle and the existence of conversational implicatures, which lead to a further generalization of the notion of relevance, giving it more and more the status of somekind of a pragmatic law of gravitation and of a global and absolute constraint, confining it more and more to the status of the powerful, and often limitless (and self explaining) mechanism it has become in Relevance Theory.

As was already said, because this whole process strongly and correctly advocated for the idea that utterances have not only a meaning but also, and even first, an interlocutive value, this approach has considerably changed our understanding of pragmatics. It has, among other things, led pragmatics to recognize the importance of the addressee in the interaction, an assumption which speaker-centered perspectives on language such as speech-act theory, deeply lacked.

But if using relevance as a mean of explaining all sorts of pragmatic phenomena – but basically implicatures – has been central in the post-Gricean tradition for more than ten years now, explaining relevance itself, and for instance accounting for the unexpected relevance of many utterances is something quite different (Nemo, 1988). Indeed, whilst relevance was considered an overwhelmingly powerful and central mechanism to pragmatics, we were not yet able to explain the relevance of truisms, tautologies and of the most ordinary retorts, or facts such as:

- the fact that a mother can tell one of her children “I am not your dad”;
- the fact that the father can tell him/her “I am your dad”;
- the fact that the 15 years old child may answer “I am not three years old”;
- the fact that one can say “Nadia_i n'est pas sa_i sœur” (Nadia_i is not her_i sister);
- the fact that *P* is a perfect rejoinder to *peu P* (little *P*), even though *P* is an implication of *peu P* and that its uttering seems to add nothing new to what was mutually manifest, etc.

⁴⁸ P.H. Nowell-Smith (1954, p. 82).

All these examples, if they don't contradict the hypothesis of a constraint of relevance – which is clearly impossible to falsify – leave us with the strange feeling that relevance ought to be considered more as a problem than as a solution.

But surprisingly, the answer to the question of why all those utterances are actually relevant has been found for long, but spelled in a completely different perspective and formulation under the name of argumentative orientation (Ducrot, 1980b; Anscombe and Ducrot, 1983).

7.1. The scalar constraint (SC) on relevance

To reformulate here this idea of argumentative orientation in the most effective terms, and in terms of relevance, it is clear that most of what the presumption of relevance was designed to account for, is that, **whenever something is said, the first question which must be answered is “What difference does it make that *P* is the case or not?”**⁴⁹

7.1.1. Interpretative traces of the SC

This is actually why saying “I am not your dad” may actually mean things such as “go and see your dad directly”, this is also why saying “I'm your dad” may sometimes mean things such as “Don't talk to me like that” and sometimes things such as “You can talk to me”, this is still why it can be guessed that what the utterance *On est Alsacien ou on ne l'est pas* (one is Alsatian or one is not) is talking about is something for which it makes a difference to be Alsatian or not.

Similarly, this is why answering “He is French” to the question “Does he know how to cook?” (Kempson, 1996) may be explained by the sole hypothesis that this answer must be interpreted through the question “What difference does it make for cooking abilities to be or not to be French?”. And this is also why one cannot answer “It's right around the corner” to somebody looking for a gas station (Sperber and Wilson, 1986b, in Davis, 1991, p. 388) and asking “Do you know where the closest Gas station is?” if this station is actually closed: **do not say something which makes no difference** (to what is at stake) would probably be the most direct description of cooperativeness.

⁴⁹ The notion of conclusion (and argumentative orientation of utterances) developed in the **Argumentation dans la Langue** framework was actually the answer to the question “For what does *P* make a difference?”. Meanwhile the conversational implicatures framework was insisting on the existence of answers to the first question, but without considering the question itself. The advantage of this Ducrotian and post-Ducrotian **scalar hypothesis**, compared to the **inferential hypothesis**, is that if the principle of relevance does explain why (the final or initial cause) implicatures would be generated, it does not really explain how (the proximal cause), Ducrot's descriptions work exactly the other way round.

7.1.2. Linguistic traces of the SC: Mais (but) and De toute façon ('anyway')

As was advocated at the start of this article, semantic and pragmatic constraints, when they do exist, leave both cognitive, linguistic and conversational traces. Thus, after considering first the cognitive traces of the existence of a scalar constraint, we shall consider now linguistic traces of the existence of the SC. As was already mentioned, *Toujours*'s semantic indications that something makes no difference is one such trace. And we shall consider here two more: the French morphemes *mais* (but) and *de toute façon* ('anyway')⁵⁰.

Considering first the discourse marker *De toute façon* and the examples (47)–(50), all examples borrowed from Corinne Rossari's work on reformulative discourse markers (1994, pp. 66–67), the same kind of scalar disappointment can be noticed:

- in all the utterances of the form 'A *de toute façon* B', the utterance B implies that it makes no difference whether A or not A.
- with 'A *de toute façon* B', to use Rossari's phrase, "*Il ne sert à rien de dire A puisque de toute façon B*" ("It is not worth saying P as anyway Q").

- (47) (A) – Où as-tu trouvé ce sac?
 (B) – *De toute façon*, c'est un modèle qui ne se fait plus.
 (A) – Where did you find (buy) this bag?
 (B) – *De toute façon* ('Anyway'), it's a model which is not made any more.

In this dialog, what *de toute façon* means is that the question is not worth answering, because it wouldn't make any difference knowing where the bag was bought, as it is not made any more.

- (48) (A) – Quand on veut, on peut.
 (B) – *De toute façon*, je ne veux pas.
 (A) – If you want to, you can.
 (B) – *De toute façon* ('Anyway'), I don't want to.

Similarly, in dialog (48), what *de toute façon* means is that the validity of the implicature makes no difference, as its premise is not true, which is to say that it doesn't matter that "if you want to you can" when you actually don't want to do (something).

- (49) Avec un type comme Ackley, si on levait les yeux du livre, on était foutu.
De toute façon, on était foutu.

⁵⁰ This translation, as all translations of discourse connectives, must be understood as strictly indicative.

With a guy like Ackley, if you just lifted your eyes from the book, you were in deep trouble.

De toute façon ('In any case'), you were in deep trouble

In (49), just like in (48), but in a monological context which gives it an autocorrective dimension, it is the conditional "if you ..." which is presented as incorrect: it actually makes strictly no difference to lift your eyes from the book or not, as in both cases you are in trouble.

- (50) (A) – Jean ne prends plus de caviar au petit déjeuner.
 (B) – *De toute façon*, il n'en a jamais pris, il prétendait en prendre.
 (A) – John doesn't have caviar for breakfast any more.
 (B) – *De toute façon* ('Anyway'), he never had any for breakfast, he just pretended to.

Here again, the fact that now John is not having caviar for breakfast is said to make literally no difference as ... he didn't have any for breakfast in the past neither. Thus, what happens in all those examples is once again that the utterance B implies that it makes no difference whether A or not A. This is even clearer with example (51):

- (51) Ecoute, c'est un bon prix, et de toute façon il n'est pas négociable.

Listen, it's a good price, and *de toute façon* ('anyway') it is not negotiable.

because what is said is not that saying A is not worth while, but that saying not-A, or arguing on A, wouldn't be worth while. And finally, it can be observed that this scalar disappointment value can cover whole discourses, discussions and conversations, either backwards, as in utterance (52):

- (52) *De toute façon*, tout ça, c'est du passé!

De toute façon ('Anyway'), all this is history!

or forward, as when (53) is uttered to say in advance that whatever could be said or asked, it would not and should not make any difference to the performative reality of the speaker not being there:

- (53) *De toute façon*, je ne suis pas là!! C'est clair?

De toute façon ('Whatever they say'), I am not here!! Is that clear?

Similarly, it seems that the indication *mais* (but) conveys – which explains simultaneously its conversational and discursive uses, for instance (54), but also apparently marginal non contrastive uses such as examples (56)–(59) – may be spelled out this way:

What *mais* (but) indicates in *P mais Q* is that *P* is not making the difference it was expected to make, because of (or as regards) *Q*.

This is clearly apparent with example (54):

- (54) Il(Elle) est venu(e) mais trop tard. ((S)he came but too late.)

what has to be explained being the reason why “(S)he came” may be opposed to “(S)he came too late”, although the second clearly implies the first:⁵¹ for ‘(S)he came’ to have a scalar value, it must make a difference, no matter which, to have come or not. By saying ‘(S)he came too late’, what is meant is that when (s)he came, it was no longer making any kind of difference to whatever was in question. So, what (54) means is that the fact of coming late withdraw some or all scalar value to the fact of coming.

If we consider then utterances (55)–(59):

- (55) Il a beaucoup plus *mais* le pont a tenu (It rained a lot but the bridge held on/withstood).
- (56) Il a laissé les clefs mais où? (He left the keys but where?)
- (57) Mais arrêtez-les! (But stop them!)
- (58) Mais c’est pas vrai, il lit le Chinois! (But this is not true, he reads Chinese!)
- (59) Il est beau mais beau!! (He is beautiful, but beautiful!)

It is easy to observe that as different as they are, and as problematic as they may be for a Ducrotian argumentative account or for a contrastive description, what *mais* indicates in all the cases is that:

- the fact that it rained a lot, which was expected to lead to the possible destruction of the bridge, didn’t produce the expected effect.
- the fact of knowing that the keys are around is of no help to know where.
- the fact that they are fighting should lead the addressee(s) to stop them, but has not, so that (57) should not be described simply as an opposition to a behaviour (Ducrot et al., 1980a) but rather as a criticism of the absence of reaction of the addressee(s) to the fact that some people are fighting.
- the fact of seeing/constating that the person concerned reads Chinese should lead the speaker of (58) to believe it, but actually doesn’t, so that (58) could be paraphrased *Je le vois et je ne le crois pas* (I see it and I don’t believe it).

⁵¹ In Ducrot (1980c, pp. 11–22), various examples of utterances with *mais* (‘but’) are given in which there is no obvious opposition between the two connected propositions *P* and *Q*, as, for example, when the proposition *P* seems to be a very plausible consequence of the proposition *Q*.

- he is not only beautiful but beautiful (astounding), which implies both that there is beautiful and beautiful, and that the difference there is between beautiful₁ and beautiful₂ is the difference it actually makes.⁵²

This indication is also strong enough to allow for an answer such as:

A teacher to a student he had seen earlier very nervous before an oral exam.

- (60) – C'est fini? (– Is it over?)
 – oui, mais ... *moue* (– yes, but ... *pout*)

to be perfectly interpretable and relevant: first because the *Is it over?* question is interpreted as *Do you feel better?*, the fact of feeling better being the difference the end of the exam should make, second because the answer combines the answer *oui* (yes) to the explicit question and the *mais* answer to the implicit question (Do you feel better?), hence communicating on one side that he did finish and on the other side that it actually didn't make feel him any better, which eventually allows the hearer to draw the inference that he has failed the exam.

7.2. The scalar constraint and the modal framing of reality

But if the scalar constraint on relevance is probably the most important constraint on relevance, it is not because it is the only constraint but because it is a key to understand the complex nature of relevance. The conditions of relevance of an utterance may not in effect be described in general: they vary according to the specific types of utterances which are concerned, even if the importance of the SC on relevance is due to the fact that it is shared by all kinds of utterances.

A description of relevance, hence, cannot adopt a pre-Austinian view of the nature of utterances which would suppose that the question of the conditions relevance of a question, the conditions of relevance of a directive utterance or those of metaphors could simply be ignored.

But before showing it with directive utterances, we shall first describe the modal framing background of the Scalar Constraint.

7.2.1. Modal frames and the semantics of informative utterance

The minimum semantic difference between a sentence (or proposition) and an utterance is that the sentence is (only) an image of the reality whereas an utterance is the association of an image of the possible and an image of the reality. In our

⁵² This last example, the *mais* *surréalisant* (surrealising) following Garcia-Negroni (1995), shows that if, compared to *toujours* and *de toute façon*, *mais* does not focus on whether something makes a difference or not, but on what difference it makes, there is no reason to believe that *mais* must have a disappointing effect on the scalar value of the utterance: it may as well indicate that the difference something makes is bigger than what would be believed at first sight.

7.2.2. Modal frames and the semantics of scalar orientation

All utterances, according to Ducrot (1980b) and Anscombre and Ducrot (1983), have a scalar orientation. Since Sapir's (1944) work on grading expressions, and the considerable continuation and development it has received in Ducrot's work on argumentative (i.e., scalar) operators, – such as *peu* (little), *un peu* (a little), *presque* (almost), *à peine* (hardly), *seulement* or *ne ... que ...* (only) or *trop* (too much or too many), etc. ... – the linguistic traces of such scalar orientation are numerous. The problem, however, is to understand why.

To account for the scalar orientation of utterances, that is, to understand how a certain reality can lead to opposite conclusions, the **comparison constraint** must be spelled out:

Given the fact that the scalar value of an utterance depends on a comparison of the different possibilities which are introduced by the utterance, the scalar orientation of the utterance depends on the possibilities which are, or which are not, introduced.

If we consider for instance the utterances (64) and (65) and the surprising relevance of answering/retorting (65) to somebody who just uttered (64):

(64) Il a peu souffert (He suffered little *or* He didn't suffer much)

(65) Il a souffert (He suffered)

First of all, it is clear that there is no need of any old information to understand what is going on: in utterance (64) the modal background consists in opposing suffering a little and suffering a lot, in which case suffering 'little' is not so bad. On the contrary, in utterance (65) the modal background consists in contrasting the fact of suffering with the possibility not to suffer at all, and therefore it presents the suffering as 'bad'. Thus, by answering (65) to (64), or by opposing them with a *mais* (but), what (65) actually reminds the speaker of (64) of is that the person in question might not have suffered at all, a possibility which the first utterance was simply not considering at all.

Hence, the relevance and interlocutive value of the answer (65) is completely dependent on the difference suffering or not suffering makes, and not at all on any new information (65) would convey. Yet, there are no reasons to believe that (65), because it is clearly uninformative and therefore violating Grice's maxim of quantity, would be considered irrelevant: if it doesn't not change anything about the representation of the world, it does change locally the set of possibilities to be considered, in other words what we shall call from now on the interlocutive image of what is possible (the modal frame). First of all, it is clear that there is no need of any old information to understand what is going on: in utterance (64) the modal background consists in opposing suffering a little and suffering a lot, in which case suffering 'little' is not so bad. On the contrary, in utterance (65) the modal background consists in contrasting the fact of suffering with the possibility

not to suffer at all, and therefore it presents suffering as 'bad'. Thus, by answering (65) to (64), or by opposing them with a *mais* (but), what (65) actually reminds the speaker of (64) is that the person in question might not have suffered at all, a possibility which the first utterance was simply not considering at all.

What is said about what is the case is thus not contrasted with any context or cognitive environment but with a limited number of possibilities which are chosen by the speaker him(her)self, but which must be ratified by the addressee. And once again we are led to observe that, because **the difference it makes depends on what is compared to what**, the same reality – as may be observed with (64) and (65) – being contrasted either with more advantageous possibilities (64) or worst (65) so that what is the case finally becomes either negative (64) or positive (65).

This modal framing of the reality is another form of comparison, the form that affects the predicate and not the interpretation of the words themselves: by choosing the possibilities which will be contrasted, those which will be simply ignored and those which will be taken for granted, the utterance's modal frames are shaping both the way a reality is perceived or presented, the argumentative orientation of the utterances, and, because those frames have to be ratified by the addressee, the nature of interlocution.

Moreover, the fact that any reality may be contrasted with a better (or worst) possibility, making it look negative (or positive), allows language to stop being a representational device to become a **presentational** device, i.e., to present the reality under a specific (and discutable) perspective. It is possible to say *I have only four cars*, presenting this number as small, and, as Anscombe and Ducrot insisted, it is both possible to say:

(66) Il était *presque* en retard (He was almost late).

(67) Il était à *peine* en retard (He was hardly late).

presque (almost) and *à peine* (hardly) being able to reverse the scalar value of the predicate, by quantifying the possibility to be late in the first case, and by quantifying the possibility to be in time for the second. A choice of modal set which, by simply ignoring the fact that the person was in time (in (66)) or was late (in (67)), determines the scalar orientation of the utterance.

7.2.3. Modal frames and the semantics of presupposition

The heuristic interest of introducing modal frames is in effect not only to provide a concrete description of the (semantic) conditions of relevance, but also for instance to provide new insights into the nature of presupposition. If we consider first the semantic difference between the two utterances:

(68) The match took place and Liverpool won 4 to 1.

(69) Liverpool won 4 to 1.

it seems clear that these two utterances give the same information, but differently: (68) asserts that the match took place, meanwhile (69) presupposes it.

A modal frame analysis, however, reveals something quite different: what is in (68) and not in (69) is the fact that something has happened which made it possible for the match not to take place. In other terms, if (68) and (69) give **the same image of what actually took place**, they give **a different image of what might have taken place**.

If the modal frames are in fact pragmatic presuppositions of the utterance, it can be shown that its semantic presuppositions directly depends on them. Presupposition, as it is well known, is what remains of an utterance when it is put in the negative and interrogative forms:⁵⁵ the fact that Pierre used to smoke is presupposed by “Pierre stopped smoking”, “Pierre didn’t stop smoking” and “Did Pierre stop smoking?” Why is that so? First, because **(semantic) presuppositions are assumptions which can be entailed from any of the possibilities which are introduced by the utterance**. Second, because in the positive, negative and interrogative forms of a sentence, the image of what is possible is preserved, whereas different images of the reality itself are given (that *P* is, or not, the case, or that the speaker ignore what is the case).

This definition of presupposition has many advantages:

- it differentiates clearly presupposition from entailment. This because although “Pierre came” entails “somebody came”, it doesn’t presuppose it, simply because “Pierre may not have come” does not entail “somebody came”;
 - it is coherent with the intuitive understanding of presupposition as that which is presented by the speaker as uncontroversial. This, because what is common to all the possibilities introduced is what is presented as unproblematic;
 - it explains how presuppositions are inherited: they are what can be inferred from μP ;
 - it helps to discover presuppositions that could easily remain unnoticed.
- Consider, for example, the questions (70) and (71):

(70) How much?

(71) When do you leave?

It is clear than in most contexts what they presuppose is not so apparent. In other contexts however, the modal frame explanation of presupposition makes it easy to explain why (71), because it only considers as problematic the moment the person will leave and not the fact that (s)he is leaving, which is not presented as something which might not be the case, can turn into an indirect speech act, a way to ask somebody to leave. Once again, one cannot account for a pragmatic phenomenon – here the indirect request use of (71) – without understanding the semantics of the modal frames which are introduced.

⁵⁵ See Ducrot (1972), and Soames (1982) for other forms “keeping” the presupposition.

Similarly, it can be shown that what (70) presupposes, when (71) is a question about how much money is to be paid, is that what the question is about can be paid for! Which in some cases may be clearly insulting, and in all cases is a presupposition exactly the way “Pierre used to smoke” is a presupposition of “Pierre stopped smoking”.

Thus, a general conclusion may be spelled out: if comparison (contrasting realities), modalisation (contrasting possibilities) and modal framing (contrasting the reality to such or such possibility), are central to the study of utterances, they are in the same time only the foreground of utterances, whose background is formed of the possibilities which are either ignored or presented as self-evident.

7.2.4. Modal frames and the (scalar) strength of utterances

To go a little further in the description of the semantics of relevance, we shall describe now two last constraints on scalar value which account for the scalar strength of an utterance. The first one is the **Scalar Slope Constraint**:

Given the fact that an utterance E makes a difference for an utterance R, then the scalar strength of the utterance E depends basically on whether the difference that E makes for R is small or big.

the second is the **Modal Slope Constraint** and operates within the scalar slope constraint:

Given the fact that it makes a difference for an utterance R if E is the case or not, the more not-E will be possible (likely), the bigger the difference the fact that E is the case will make. And hence, the stronger the scalar value of the utterance E will be (and vice versa).

This last constraint, the quantification of the power of the opposite as Duns Scott called it, is, as odd as it may seem, a very powerful constraint. This can be observed with particles like *même* (even), with discourse markers as *et encore* (‘if that’), in dialogs or even in ordinary conversation!

To give here some examples of interpretative or linguistic traces, we may consider the following utterances:

(72) *Même* Paul est venu. (Even Paul came.)

(73) Ils n’ont gagné qu’un match sur 23, *et encore*, contre Sri Lanka qui n’a jamais gagné.

(They won only one match out of twenty-three, *et encore*, against Sri Lanka who has never won any).

(74) Ils n’avaient pas perdu un match ici depuis 1974, *et encore*, ils s’étaient qualifiés au match retour.

(They hadn't lost a match here since 1974, *et encore*, they had qualified on the return match.)

In utterance (72), we may indeed observe the most simple interpretative trace of the MSC and SSC, as it conveys the information that because Paul was less likely than others to come, then his coming is making a bigger difference.

Similarly, what (73) means is not that maybe they didn't even win the match they won,⁵⁶ but that this victory is just no victory, and this, according to the **Modal Slope Constraint**, because if you cannot loose, as your opponent is an absolute looser, then winning will loose all kind of scalar value.

Meanwhile in utterance (74) – a very surprising, and actually unique, example of *et encore* being preceded by the negative form – what is said is first that loosing a match is worst when you never loose any, i.e., when the probability not to be defeated (i.e., the modal slope), makes the defeat bigger (scalar slope), exactly as in (72), but then that **if you compare** the two defeats (the 1974's defeat and the t_0 defeat), the t_0 defeat makes a bigger difference, as last time they had lost but qualified later.

Two last examples will show the ubiquitous presence of these two constraints:

(75) L'équipe de France est une très bonne équipe, mais, de toute façon, en finale, il n'y a que des très bonnes équipes.

(The French team is a very good team, but anyway, in a final, there are only very good teams.)

(76) (C) – C'est cher! C – It's expensive!
 (S) – C'est de la qualité! S – It's quality!
 (C) – Tout de même! C – Even so!

The interest of example (75) is that it combines in a single utterance an illustration of the SSC and MSC and the presence of the two morphemes *mais* (but) and *de toute façon* ('anyway') which were described above. What is said in utterance (75), an utterance produced by a Brazilian player, is indeed that:

- the French team is a very good team;
- this fact doesn't make the difference it could be expected to make (to fear it, for instance), which is indicated by *mais*;

⁵⁶ As in most standard uses of *et encore* ('If that'): saying *Seuls les sans-diplômes restent, et encore!* (Only people without university degrees are staying, if that!) means something like "and not even all of them are staying". Explaining *et encore* is describing a change of modal configuration, i.e., of the comparison set: saying 'only A' or any equivalent restrictive form is comparing 'only A' with 'not only A' that is with 'more than A'. In that 'A and not more' modal configuration, A is a presupposition of the first utterance. What *et encore* introduces hence is a doubt or restriction about this presupposition: 'Only A *et encore!*' means 'Only A and (maybe) not even A!' in which 'not even A' means 'less than A' or 'not really A'. In that sense, the complete standard meaning of 'Only A *et encore!*' is 'Not more than A and (maybe) even less than A'. This explains why *et encore* is one of the few discourse markers which do not require being followed by an utterance.

- it doesn't make any difference because in the final there are only very good teams (it cannot be not like that), which is the modal slope and scalar slope constraint combined;
- there is no difference between playing France or another very good team, which is what *de toute façon* indicates.

In other words, the first utterance loses any scalar value as its alternative (i.e., not playing a very good team in final) appears improbable.

But, in very ordinary and apparently simple exchanges of arguments, such as the dialog (76) between a customer C and a seller S, the same constraints may be observed too. It would be possible to say, as the first Ducrot, for example, would have said, that "It's expensive" is an argument for a conclusion and that "It's quality" is an argument for the opposite conclusion. But that's not what is really at stake in this dialog. The meaning of the answer "it's quality" in (76) is that "it cannot be inexpensive", which, according to the **modal slope constraint**, weakens the first utterance scalar value: if it cannot be inexpensive because it's quality, then the fact of being expensive cannot make any longer a difference. More, with the adequate intonation, this answer can even mean something like "If you cannot afford quality!". Hence, to bring back again some scalar value to the initial utterance, the customer will have to reply "Even so", this to say that "Even for quality it's expensive".

7.3. The semantics of directivity

Since non-assertive utterances became for a time the central objects of pragmatics, pragmatics has evolved in a way which is giving them a more peripheral status. The problems, however, remain, and to start with the most simple interrogation, we still need to go beyond the mere observation that a simple imperative form such as:

(77) Vas-y! (Go!)

may receive such different illocutionary interpretations as asking (or begging) to go, ordering to go, advising to go, allowing somebody to go, or even challenging or cheering him/her to do so, etc.

Hence, if we gather the various elements of description of directive utterances (Searle, 1972, 1982; Leech, 1983) and if we consider the scalar hypothesis which was introduced as one of the key issues in the question of relevance, then it is easy to observe that it is possible to operate a first distinction between the asking and ordering values on one side and the advising and allowing value on the other, by simply asking the question: "For whom does it make a difference if the person goes or not?". Asking or ordering is an **S-Scalarisation**, in other words it is for **the speaker** (and not for the addressee (A)) that it makes a difference if the addressee goes or not, meanwhile allowing or advising utterances present themselves

as **A-Scalarisation** (Nemo, 1992): one cannot allow somebody to do something for which (s)he did not manifest some desire, and therefore A-scalarisation is a condition of relevance of the allowing illocutionary act. More generally, it is not only what difference it makes that must be taken into account but also for who.

Of course, this distinction is only a first step and probably the smallest. The next step is indeed to account for the distinction between the asking and advising value on one side and the ordering or allowing value on the other. Thus, it consists on observing that despite the fact that the person who will finally act is always the addressee, **doing it may actually depend either of him or of somebody else** (the speaker here): with the advising or asking value, what is asked or advised is A-dependent, meanwhile with the allowing or ordering value it is presented as not-being A-dependent but S-dependent: to give permission to somebody to leave by saying (77), the fact (for the addressee) of leaving or not must somehow be dependent of the utterer (*énonciateur*) of (77).

This, as a matter of fact, is only an example of the necessity to distinguish between epistemic possibilities and possibilities which are actually *X*-dependent, i.e., depending on somebody, and which therefore should be called **options**. Hence, the four directive values may be described in a single chart:

	A-dependent options	S-dependent options
A-scaled options	advice	permission
S-scaled options	request	order

For other directive values, such as the warning or begging value, some conditions of relevance must be added to the conditions respectively of advice and request:

- the difference between begging and asking is basically a matter of scalar slope, in other words begging is asking when what is asked for makes a very big difference for the speaker.
- the difference between advising and warning, two speech acts with the same A-dependency and A-scalarisation conditions is that for the utterance to be relevant as a warning, it must be the case that what the speaker and the addressee knows (perceives) or believes to be better for the addressee is different from what the addressee himself perceives or believes about it:

AS-scaled options must be different from AA-scaled options.⁵⁷

In which AS stands for the speakers beliefs about what is best for the addressee, and AA for the addressee's beliefs about what is better for him(her)self.

⁵⁷ Which explains that (77) may be used with a warning force either when the speaker has perceived before the addressee that he should be leaving, and in situations in which there is a disagreement between the two interlocutors about what is best for the addressee.

Similarly, the analysis of commissive utterances (Nemo, 1992) would show that promising implies S-dependency and A-scalarisations, but, unlike directive actions, speaker's action (or at least never addressee's action). The same is true for threatening somebody of going something except for the direction of the A-scalar slope, which is normally positive ($P > \text{not-}P$) in a promise, and negative ($\text{Not-}P > P$) in a threat.

If, of course, the combinatory possibilities are numerous – more than the simple listing of illocutionary acts, more than explicit performative verb and many simply nameless – the problem is not to describe here all these possibilities but to start knowing the most important letters of the semantic alphabet of all non-constative utterances.

Once again in effect, it is clear that as soon as one drops the assumption that an utterance like (77) must have a 'locutionary' representational content (the fact of going) to suppose that its semantic content is comparational (as it concerns the difference for somebody to go or not to go), then it is possible to stop describing the pragmatic aspect of utterances as a matter of illocutionary force, to explain it in terms of scalar orientation and in terms of X-dependency.

7.4. *The semantics of performativity and of X-dependency*

That there are things which are X-dependent and things which are not, is probably one the most important observation that can be made in the study of utterances. It is so, simply, because **it actually accounts for no less than the semantic difference between constative and performative utterances**. For an utterance P to receive a performative interpretation, it must in effect be the case that the fact that P is the case or not actually depends on somebody.

And once again, this discovery is only a revelator of the limits of the people-free perspective which has been for long adopted in semantics: in a world where man exists, there are things and reality of this world whose existence and reality actually depends on people. And the idea of a language that would describe only things which exists out there independently of any human being may be a scientist's dream, or a logical empiricist's dream, but it cannot be a linguist's dream, simply because natural languages are human languages.

But let us start with concrete traces of the existence of the X-dependency feature.

If we consider for instance the fact that it is raining or not, it does not seem, at least in many cultures, to depend of anybody: thus, if someones say *Il pleut* (it rains), it may be said to lead to a conclusion (Let's go to the swimming pool for instance) and/or because of the difference it makes, it may also be indirect advice (Take your umbrella), but the fact that it rains is nothing but a fact.

But if we consider now the fact that a room is hot or not, it starts to be the case that it is (partially) X-dependent: we may open the window or doors, or lower heat-

ing systems to change this situation. Therefore, an utterance such as *Il fait chaud ici* (It's hot in here) will be quite often interpreted as a request to do something about it: indirect speech acts of request always suppose X-dependency.

Similarly, saying *La poubelle est pleine* (The bin is full) is both describing a reality, asking to take into account the difference it makes for the bin to be full or not, and reminding that it depends on us that the bin remains full or not (we can empty it). The fact that things partly or completely depends on people to be or to stay the way they are is what makes all those utterances both constative (as what they describe is either true or not prior to the enunciation) and performative (as it actually depends on us to change it). Hence, it cannot be maintained that there would be completely constative utterances on one side and completely performative utterances on the other. This either because describing something is quite often a call to change it, and because the people-free reality and the people's reality may sometimes coincide, as in the utterance (78):

(78) Il y a des bières dans le frigo. (There are some beers in the fridge.)

It is clear indeed, with (78), that it is both a plain fact that there is actually some beer in the fridge, and that – as was already mentioned in Section 1.3 – if (78) may be used to say “Help yourself if you are thirsty!”, it is because people are not supposed to go and pick up beer in a fridge which is not theirs. So that, in fact, as a social performative reality, it depends on the owner of the house whether there is beer or not. Which is why (78) is in fact both used to allow and to suggest the hearer to pick up a beer and drink it.

This semantic feature is therefore recurrent in explicit performatives too, even if sometimes it turn out to be actually problematic: for instance, the French performative formula *Je m'excuse* (I apologize) was for long considered impolite and therefore unacceptable, precisely because it implied that excuses could be S(peaker)-dependent and not A(ddressee)-dependent, as in *Excusez-moi!* (Excuse me!).

Moreover, this feature is also very important to describe phenomena which at first sight seem to be completely unrelated to performativity, among which all the semantic phenomena which involve somekind of presence of intentionality. Such as the philosophical difference between saying that somebody is walking to the bakery and saying that (s)he is walking south: it may be a fact that by walking to the bakery this person is walking south, but we do have the feeling that the first process is X-dependent and the second is purely accidental. Or such as the well known examples of oblique context for which the X-dependent interpretation is not true meanwhile the X-independent interpretation is true.

As, moreover, this X-dependency feature may be also part of the semantic content of many verbs – a very simple example being the difference between *entendre* (to hear) and *écouter* (to listen), but also in much more subtle examples: *se retrouver* (to find oneself, to meet) is used in situations either in which what is happening is not on the subject's control (to find oneself pregnant, to find oneself face to face

with somebody) or in which there is a co-dependency of the situation⁵⁸ – lexical differentiation in some cases, systematic polysemy on the others, are probably the main consequence of the existence of the *X*-dependent versus *X*-independent feature.

Hence, we are here again in presence of a phenomenon which despite being central for the semantics of performativity leaves in fact all kind of traces, from the more pragmatic/interactional/sociological ones, such as (78), to the more semantic/linguistic ones, such as lexical traces.

A situation, which is most apparent in the utterance:

- (79) Seules les tables propres, bien rangées et silencieuses pourront sortir
 (Only clean, arranged and silencious tables will be allowed to go out)

This, simply because in this utterance, the *X*-dependency feature concerns simultaneously:

- the fact of leaving the room, which is S-dependent;
- the fact of cleaning (being clean), which is A-dependent (Table-dependent);
- the fact of arranging what's left on the table, which is A-dependent (Table-dependent);
- the fact of keeping silent, which is A-dependent (Table-dependent).

Which explains why the utterance may be paraphrased “Clean up your table, arrange it, keep silent and you will be allowed to go out”, why it consists in the spelling of a set conditions to go out (“Do all this and you leave”). The whole process allowing us to observe a **transfer of X-dependency** (Going out depends on you).

7.5. *Relevance and the semantics/pragmatics interface*

As was already pointed out several times, and as is supported by all the descriptions which have been proposed so far, from the description of tautological utterances – an ideal test for the validity of both approaches – to the description of directive relevance, the main differences between the semantic account of relevance which I have presented here and Sperber and Wilson's Theory of relevance are the following:

- relevance must be considered as a problem and not as a solution;
- the relevance of non-assertive utterances must be accounted for exactly as the

⁵⁸ In *Picasso devait retrouver Fernand Léger ce jour-là* (Picasso was to meet Fernand Léger on that day), the fact of meeting is not dependent on Picasso or Fernand Léger, but on **an agreement between them**.

- relevance of assertions, to avoid pragmatics returning to a pre-Austinian⁵⁹ state;
- the context, in Sperber and Wilson sense of a cognitive environment formed of mutually manifest assumptions, plays no central role in the determination of the interlocutive value of an utterance;⁶⁰
 - the interpretation of the utterance is not a matter of a new assumption encounter with old knowledge,⁶¹ as in an expert system, but of the modal and scalar framing of any information;
 - **differences are not inferences;**
 - the difference something makes depends mainly on what it is compared to, in other terms a reality's 'implications' are dependent of the modal frame which the utterance introduces;
 - the interlocutive value of an utterance depends on the ratification by the addressee of the modal frame which has been introduced by the utterance.

However, the most important conclusion to draw from a modal and scalar frame account of relevance is that it is not possible to consider that there would be on one side a semantic process centered on the coding information and a pragmatic process centered on the contextual drawing of inferences.

As soon as utterances are described (minimally) as associations of an image of the reality and an image of what is possible, and not as mere images of the reality, then it is not possible to identify semantics with the study of the propositional content, nor to ignore that this content is not what is actually coded in the mor-

⁵⁹ It is indeed quite surprising to find (Blakemore, 1987, p. 2) asserting simultaneously that "speech-act theory is central to pragmatics" because non-declarative utterances are, and to admit in a book that concerns the semantic constraints on relevance that "the questions raised by non-declarative utterances are not central to the main concern of this study".

⁶⁰ One of the main difference between the scalar and inferential hypothesis concerns indeed the role of context: in the second hypothesis, the generation of implicatures (Sperber and Wilson, 1986a) is described as the effect of "newly presented information [...] on the old information drawn from a representation of the world" (p. 107), while in the first hypothesis the existence of a constraint of relevance leads to the construction of a modal frame (i.e., of a set of possibilities which are contrasted) which is central to the understanding both of what is said and of the difference it makes, and which must be unified with contextual elements in order for the utterance to be fully relevant.

In other words, the predictions of the two models differ on the context given/context chosen issue and about the mutually manifest chosen context issue. The first problem is that if it is clear, even for Sperber and Wilson themselves (1986a, p. 132) that the context is not a 'natural' environment but a chosen one, it seems to be the case on all the examples S&W describe, that the contextually relevant information is actually accessible through the modal frame introduced by the utterance. The second being that it is not logically possible to skip from the idea of a given context, in which assumptions would be mutually manifest, to the idea of a chosen context that would be 'mutually manifest' to the interlocutors. If the context is chosen by the speaker then how could it be mutually manifest? And if it is not mutually manifest but rather negotiated, as is apparent in all kinds of data, then how could this 'context' be a context?

⁶¹ As a matter of fact, this dynamic dimension of speech is undeniable, but the problem is to know if it can account for relevance or not, and if we should view new information as added to old information, and communication as a cumulative process or if we should view this dynamic dimension as the place of negotiation and co-ratification.

phemes. It follows from this that the modal and scalar frames are bidimensional realities whose interpretation is simultaneously semantic, as they convey a representation of what is possible, and pragmatic, as this representation of what is possible must be adapted to the addressee, ratified by him, and, because they are the frames through which any (spoken) reality is interpreted.

8. Attentional contexts

The study of non verbal communication in primates or young children is also very interesting for pragmatics as it puts into direct light some aspects of the communication process which are probably both omnipresent in human verbal communication and completely hidden in its more salient aspects (Conein, 1998).

The role of vision in communication for instance is quite revealing of the inevitable diversity of communicational contexts. Mutual attention, coordination of attention and manipulation of attention, are some examples of these communicational contexts. In Goffman's early writings (1961, 1963), interaction is defined by a visual and attentional common focus. But there are actually other forms of attention than mutual attention or non coordinated attention, and other ways to coordinate attention than the bi-directional social and mutual look. For instance the deictic look, i.e., the look on what the other is looking at, which may be observed (Butterworth, 1991) in children at the age of twelve months, and appears as the second step of joint attention, which appears earlier (6 months) with the child following the (m)other's look but without looking at what (s)he is looking at.

Another very interesting form of coordinated attention is controlled attention, i.e., taking and controlling the direction of the other's look. The difference between mutual attention and deictic attention or controlled attention (Conein, 1998), is that mutual attention involves two objects, which are the two persons, meanwhile deictic attention and controlling attention involve three objects, the two persons and the target-object.

It should be added that controlled attention may take various forms, Ego may catch Alter's look to share something which he has seen, as in Sperber and Wilson's (1986a) prototypical example of somebody leaning back to render manifest the arrival of a third person to somebody else, but it may also take more manipulative forms, such as making alter focus on something to lead him to a certain behaviour, as in Anscombe and Ducrot typical examples of argumentative orientation, but it may also be deceptive, as in cases in which ego is going to focus alter's attention on an object simply to distract him from noticing something else.

If all this is so important for pragmatics, it is because taking into account that in language use, the same processes of attention's controlling are at work, and that taking into account the diversity of ways that attention may be controlled and the diversity of aims of such actions, allows in fact pragmatics not to choose between Anscombe and Ducrot's focus on the ascriptivist/manipulative dimension

of attention's control, and Sperber and Wilson's focus on sharing an environment. Nor between Grice's focus on cooperation and most primatologist's concern about deception and machiavelian intelligence.

As importantly, it allows us to re-consider the contemporary division of pragmatics into an object-free pragmatics centered on mutual attention and Goffmanian encounters, and a people-free pragmatics centered on ostensive communication and controlled deictic attention (making Alter look where Ego looks). Mutual attention is present in verbal interactions, but so is controlled attention, and none of the two approaches can pretend to be the center of pragmatics. This because pragmatics has no center and because the variety of attentional contexts should be considered before formulating general assumptions about the nature of communication or language.

The unity of pragmatics, hence, depends on the possibility of taking into account simultaneously mutual attention (and interpersonal interaction) and controlled attention, and to consider both direct relations between participants and the complex relations that interlocutors may establish about something.

As may be shown quickly about the description of the notion of contribution, a notion that has remained an overlooked (and almost clandestine) concept, despite its early appearance in pragmatics in the formulation of the Gricean conversational maxims.

If it seems indeed to have been considered, without discussion, that contributions and utterances were one and the same thing,⁶² it is very important to avoid this confusion and to understand that the constraints on utterances – such as the scalar constraint, the modalisation constraint, the comparison constraint, etc. – and the constraints on contributions are of quite a different nature.

At the contributonal level in effect, the language/world relationship is simply reversed and the selecting nature of any contribution reveals that the logical empiricist's dream of a language that would represent the reality must be abandoned to recognize that whatever is said is paid in terms of what is left unsaid. And that not talking of something or somebody is actually as important as talking about it, and that pragmatics simply may not forget it.⁶³

As long as the utterances are considered one by one, this dimension cannot be perceived, but as soon as they are considered as a whole, then the **“This (is what) must be taken into account”** or **“This (is what) should be considered”**⁶⁴ nature

⁶² Even though it is actually clear that a contribution may be formed of a single utterance, it is also beyond doubt, especially in Grice's maxims, that there is no reason whatsoever to believe that contributions should be formed of a single utterance.

⁶³ This is one of the reason why, even in a strictly pragmatic perspective, pragmatics cannot be reduced to the study of the interpretation of utterances.

⁶⁴ As in Grice's famous example of *Mr X writes a very good English and is assiduous*, or in Kempson's example of the answer *He is French* to the question *Does he cook well?*, but also in all Anscombe and Ducrot's examples of intrinsic argumentative orientation.

of contributions becomes apparent.⁶⁵ Which explains why their fundamentally social value, a value of intervention in a social context, is also interpretable in terms of the speaker's goals (or relations to things). Contributions, in that sense, are revealing the interlocutors aims or affects, a dimension which, despite not being part of the communicated content, is clearly part of the understanding we have of the communication process. As it answers the question "Why did (s)he say that?" or "Why did (s)he say only that?" or "Why didn't (s)he say anything (about that)?", etc.

Understanding communicational goals is of course very important, as for instance, with (80):

A teacher to a student he had seen earlier very nervous before an oral exam.

- (80) – C'est fini? (– Is it over?)
 – oui, mais ... *moue* (– yes, but ... *pout*)

The mere fact of asking the question meaning (for instance) that the teacher considers the student's relief as important, so that through the questioning itself, the teacher is actually demonstrating (or willing to demonstrate) empathy, etc.

But more importantly, the contributonal level is important because the contributions' deeply interactional, and forcefully enumerative, dimensions, make them the missing link between utterances and conversations, but also between utterances and discourse.

9. Conclusion

From all what we have seen, many conclusions may be drawn as regards the semantics/pragmatics interface, but the most important clearly is that, as soon as semantic contents appear to be pragmatically motivated, and pragmatic values to be closely dependent on (semantic) modal and scalar representations, then it is clear that the problem is not to look for an interface between supposedly independent dimensions but to accept the fact that:

- semantics cannot find purely semantic answers to purely semantic questions;
 - pragmatics cannot find purely pragmatic answers to purely pragmatic questions;
- simply because whatever affects the saying process actually leave traces in semantic content, which allows semantic contents to produce pragmatic effects. And hence allows these semantic traces to be probably not only the best windows for

⁶⁵ This property is an emerging property, which may not be derived from any of the lower levels of interpretation: at the contributonal level, the interlocutors are selecting what in the world must be taken into account and what may be ignored, what is important and what is not, what should be looked at and what is not worth looking at. And once again, the impossibility of a language/world mirror relationship is manifest, as humans are filters and their contributions a matter of choosing what will be put in front of everybody's attention, and what will be left out of sight.

the pragmaticians to discover the exact nature of pragmatic constraints, but often the only traces of such constraints.

If this is the case, it must be understood, it is mainly because of the relation we have with things, which forbids both the people-free semantics of some semanticist dreams and any object-free pragmatics. The world human languages refer too is a human world, i.e., a world built on human experience and a socialized world.

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CHAPTER 14

The Pragmatization of Semantics

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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1. Introduction

During the middle of the present century, Charles Morris and Rudolf Carnap established their triadic division of the theory of language, which has since become one of the determinants of our theoretical understanding of language:¹

syntax was to deal with the relations between expressions;

semantics was to address the relations between expressions and what they stand for;

and

pragmatics was to examine the relations between expressions and those who use them.

The aim of this paper is to summarize some recent considerations of the nature of language and linguistic theory which seem to challenge the usefulness and adequacy of such a division and to indicate that these considerations may provide for a new paradigm. I attempt to show that these considerations indicate that the Carnapian boundary between syntax and semantics is, in the case of natural languages, misconceived; while that between semantics and pragmatics is more stipulated than discovered.

The Carnapian paradigm has been challenged, during recent decades, in two ways; we may call these the *internal* and the *external* way. By the internal challenge I am referring to the mutation of the Carnapian model evoked 'from inside', namely a development of linguistics and logic which extends Carnapian semantics far beyond its original boundaries to swallow up much of what was originally counted to pragmatics; while by the external challenge I mean the questioning of the whole model, namely a development within the philosophy of language which casts doubt on the entire Carnapian way of viewing language. These two movements are largely independent of each other, but they may be seen as manifesting the common drift to what can be called the *pragmatization of semantics*.

2. The 'internal' challenge to the Carnapian paradigm

2.1. *The problem of indexical and anaphorical expressions*

It was especially Carnap's book *Meaning and Necessity* (1956) that pointed out the direction for those who wanted to account for the semantics of natural language via modelling it with the help of formal languages of logic. Before Carnap indicated how logic can surpass extensions, the models logic had been able to offer were, from the point of view of natural language, hopelessly oversimplified. Carnap initiated the process which culminated in Montague's (1974) intensional logic,

¹ See, e.g., Carnap (1939).

thereby establishing a firm foundation for what we now call *formal semantics of natural language*.² The intensional model finally convinced many linguists and philosophers of language that to see natural language ‘as a logic’ and to develop logical languages for the purpose of modeling natural language may be enlightening. Thus Carnapian semantics came to fruition.³

However, it soon became clear that to reach an exhaustive semantic analysis of natural language we unavoidably trespass on the boundary which Carnap drew between semantics and pragmatics. The meaning of an expression in the sense of Carnapian semantics was supposedly something ‘context-independent’, i.e., something which had nothing to do with the context or circumstances under which the expressions happen to be uttered (for these were matters of pragmatics which Carnap obviously considered not addressable with the rigour he requested for semantics). However, the more practicing semanticists extended the range of natural language phenomena under semantic analysis, the less they found they could eliminate ‘context-dependence’.

The first kind of terms which resisted a ‘context-independent’ analysis were *indexicals*: words like *I*, *you*, *here*, *there*, *now*, etc. It was apparently impossible to say what these expressions meant without speaking about the circumstances of their utterance. Their denotations are obviously dependent on such or other aspects of the context; and in fact it is natural to see their meanings as some kinds of functions which yield a denotation when applied to the context. Thus, *I* may be seen as denoting an individual in a similar way as *Jaroslav Peregrin*, but the individual is determined only by the application of the meaning of *I* to the actual context (for what the application does is extract the utterer out of it). Hence indexicals appeared to be what I have elsewhere called *context consumers* (see Peregrin, ta1): to yield semantically relevant values, they had to be fed by the context.

The kind of expressions whose analysis then attracted the attention of most natural language semanticists towards the concept of context, some two decades ago, were *pronouns*. Again, it is hard to say what a pronoun means without talking about context: a pronoun’s function seems to be, just like that of *I*, to denote an individual somehow picked up from the context of its utterance. However, there is an important distinction between *I* and *he*: whereas *I* utilizes context in the sense of the ‘non-linguistic’ circumstances of utterance, *he* may utilize ‘linguistic’ context resulting from a preceding discourse. Thus, to understand the working of pronouns,

² For more about this establishing see Partee with Hendriks (1997).

³ In contrast to Montague, Carnap did not see the investigation of natural languages as the very same kind of enterprise as the investigation of formal languages of logic. In fact, in the beginning of his paper ‘Meaning and Synonymy in Natural Languages’ he identifies “the empirical investigation of historically given *natural languages*” with pragmatics and introduces the term “semantics” only within the context of “constructed *language systems*” (see Carnap, 1956, p. 233). However, he clearly *did* see his “constructed *language systems*” as models in terms of which we were to grasp natural languages (as witnessed, for example, by the fact that only two paragraphs later in the same paper he claims that the description of a language, such as German, “may well begin with the theory of intension”, i.e., with the theory of its semantics).

we have not only to understand that some expressions may be context-consumers, but also to realize that some other expressions may be *context-producers*: that they can provide such contexts on which pronouns (and other anaphoric expressions) then live.

Another kind of expressions the analysis of which has proved to require the concept of context are *articles*. Their classical, Russellian, analysis (see Russell, 1905; Peregrin, ta1, for a recapitulation) resulted in understanding *a* as expressing existence and *the* as expressing unique existence, but this has now been recognized as generally inadequate; for a great deal of the functioning of articles has likewise proved specifiable only in a 'context-dependent' way.⁴ The indefinite article, as it turned out, is generally best seen as a means of introducing a new item into the 'context' (and attaching a label to it); whereas the definite one is best seen as a means of pointing at a specifically labeled individual present within the 'context'. Thus, we may see *a man* as storing an item with the label *man*, and we can see *the man* as searching out an individual with precisely the same label. This allows for the intricate anaphorical structure of discourse (see also Peregrin, ta3).

2.2. *Topic and focus*

Such challenges to the traditional ways of construing the 'logic of language' have led also to the reassessment of the basic semantically relevant parsing of our pronouncements. Even the traditional concepts of subject and predicate, which were usually seen as expressing the most basic backbone of our sentences, demand a 'dynamic' approach: it seems that the concepts of subject and predicate, if they are to have the semantic import they are usually credited with, cannot be seen as delimited by the traditional rigid grammatical criteria. That part of the sentence which is most reasonably seen as its semantical subject need not always coincide with the grammatical subject, and similarly for the predicate. This is what was urged by Frege (1892b, p. 74): "Die Sprache hat Mittel, bald diesen, bald jenen Teil des Gedankens als Subjekt erscheinen zu lassen."

My suggestion is that what we should see as underlying the semantically relevant subject-predicate patterning of sentence is not its grammatical counterpart, but rather that which the linguists of the Prague Linguistic Circle once called 'aktuální členění větné', now usually translated as 'topic-focus articulation' (see Peregrin, 1996); for topic-focus articulation as an ingredient of the sentence structure see Sgall et al., 1986; Hajičová et al., 1998).⁵ The semantical subject coincides with

⁴ In fact, this finding goes back to Strawson (1950).

⁵ The stress which the exponents of the Circle put on this articulation is to be seen in the context of their *functionalism*, which took language to be first and foremost "a functioning system, adapted to its communicative role" (Sgall, 1987, p. 169). Such a position naturally leads to general tendencies to ground semantics in pragmatics.

the *topic* of the utterance ('východisko výpovědi'), whereas the semantical predicate coincides with its *focus* ('jádro výpovědi').⁶ This intuition can be accommodated within the framework of formal semantics in various ways. Perhaps the most straightforward of these is the one just sketched (and elaborated in Peregrin, 1996): to treat the topic as the semantic subject (picking up a piece of information 'as an object', thereby triggering an 'existential' presupposition) and focus as the semantic predicate (presenting some further specification of the object).

There are, however, other, perhaps less perspicuous ways, which nevertheless may better fit with current techniques of formal semantics. One is to base the account for topic and focus on the theory of generalized quantifiers and see them as arguments of an implicit generalized quantifier, or as – in terms of Partee (1994) – the *restrictor* and the *nuclear scope* of a *tripartite structure* (see Peregrin, 1994). In certain cases, the implicit quantifier can be overridden by an explicit focalizer, such as *always* or *only*, but also by negation (cf. Hajičová, 1994).

However, if we adopt a consequentially dynamic stance, it is best to see topic and focus as two phases of an information-conveying act (and they can be pictured as two segments of a dynamically viewed proposition). Topic corresponds to the phase where the information gets anchored to the existing 'informational structures', and focus to that where the genuine new information is being added. Therefore, the failure of the act during the topic-phase (i.e., the falsity of the relevant presupposition) means the failure of the whole act (which may precipitate a – possibly temporary – breakdown of communication), whereas that during the focus-phase (i.e., the falsity of the assertion) engenders merely the failure to add new information.

2.3. Meaning as 'context-change potential'

These and similar conclusions have led many semanticists to see meanings of natural language sentences as *context-change potentials*. (The term is, as far as I know, due to Irene Heim, who belonged, together with Hans Kamp, to the main initiators of the 'dynamic turn' of semantic theory of natural language; see Kamp, 1981; Heim, 1982.⁷) It has also led to the development of a new kind of logic which reflects this change of perspective and which gives logical analysis of natural language a surprising proximity to the theory of programming languages (see Groenendijk and Stokhof, 1991; van Benthem, 1997).⁸

In fact, we can see the development of formal semantics as the struggle for dominating increasing ranges of natural language locutions. We may see intensional

⁶ It is necessary to keep in mind that the terms *topic* and *focus* are sometimes used also in different senses.

⁷ Similar ideas have been presented by Hintikka and Kulas (1985), Seuren (1985), Sgall et al. (1986), Chierchia (1992), as well as by others.

⁸ The principles of this whole turn are summarized by Muskens et al. (1997).

logic as resulting from the effort to master the various *modal* aspects of language; we may see ‘hyperintensional’ semantic theories (like Cresswell’s, 1985, theory of structured meanings; Barwise and Perry’s, 1983, situation semantics; or Tichý’s, 1988, theory of constructions) as the result of turning attention to those aspects of language which concentrate within *propositional attitude reports*; and we can now see dynamic semantics as resulting from the effort to account for *anaphoric* aspects of language. And the same holds for the semantic entities brought about by these theories: for *possible worlds* and *intensions* of intensional semantics, for the various kinds of *structures*, *situations* or *constructions* of the ‘hyperintensional’ semantic theories, and for the *contexts* or *information states* and *context-change potentials* of dynamic semantics.

Note that the identification of the meaning of a sentence with its context-change potential does not entail that the difference between semantics and pragmatics vanishes. Take *I*: it remains a matter of pragmatics that when I now utter the sentence *I am hungry*, it will refer to me, while if you do so, it will refer to you. However, it is the matter of semantics that it always refers to *the speaker* (whoever she or he might be). Similarly it is a matter of pragmatics that *he* in *He is hungry* refers to me if the utterance of the sentence is accompanied by pointing at me, or if it follows the utterance of *Here comes Peregrin*; but it is a matter of semantics that *he* gets its referent, in a certain way, from the context.

Anyway, it no longer seems feasible to do formal semantics of natural language disregarding the concepts of context and context-dependence. The range of semantic phenomena which cannot be adequately explained without their help is vast, and the very working of language is essentially oversimplified if meanings are explicated in a way which does not account for how utterances interact with each other via contexts.

3. The ‘external’ challenge

3.1. Language as a toolbox

Along with this ‘internal’ challenge, the Carnapian paradigm has been challenged also in a quite different way; namely by the development of a wholly alternative view on language which has been claimed, by its partisans, to be philosophically more adequate and more fruitful. This view started to lurk in the writings of several analytic philosophers during the second half of this century. It is an approach based on viewing language not as a set of labels stuck on things, but rather as a kind of a toolbox, the significance of its elements thus lying in the way they function rather than in their attachment to things. The first prominent propagator of such a view was the ‘later’ Wittgenstein, who showed that to try to separate the question *what does a word mean?* from the question *how is the word used?* is futile; and concluded that thus what a word means *consists in* how it is used. “The meaning of

a word is its use within language”, as he puts it in his *Philosophical Investigations* (1953, §43).

A similar visual angle has been adopted by Willard Van Orman Quine and subsequently by Donald Davidson, who tried to approach the question *what is meaning?* via considering the question *how do we find out about meaning?* In Quine’s hands, this gave rise to the instructive contemplations of the problem of *radical translation* (see esp. Quine, 1960); Davidson speaks about *radical interpretation* (Davidson, 1984). This stance has served the philosophers to identify what it is that we learn when we learn an expression; with the conclusion, akin to Wittgenstein’s, that it is the way the expression is used. From this angle, it seems that it must be pragmatics, as the theory of how people use linguistic signs, rather than semantics, which should be the heart of a theory of language.

The impression that semantics becomes, from this viewpoint, in a sense parasitic upon pragmatics (rather than the other way around), has been underlined by the considerations of another outstanding American philosopher of the second half of this century, Wilfrid Sellars. Sellars pointed out that what appears as semantics is often rather ‘pragmatics in disguise’: that what we really do when we seemingly state the semantic relationship between a word and a thing is to specify the function of the word in question by means of invoking that of some other, familiar word. Thus, ‘*Kanninchen* means rabbit’, according to Sellars, does not state a relation between two entities, the (German) word *Kanninchen* and, say, rabbithood, it rather describes the function of *Kanninchen* within German as a function analogous to the one the English word *rabbit* has in English (see Sellars, 1963).⁹

Perhaps the most symptomatic, and probably also the most popular, picture of language reached in this way can be found in the writings of Davidson, who has most consequentially assumed the stance from which language appears to be essentially a tool or an aspect of human *action*, inextricable from the network of other actions. Therefore I shall call this kind of approach to language, which I shall see as in competition with the Carnapian one, the *Davidsonian* approach (without thereby claiming that all its details are ascribable to Davidson).

3.2. The roots of the Carnapian paradigm

We can hardly deny that the new, Davidsonian paradigm is *prima facie* much less plausible than the old, Carnapian one. To explain what makes us nevertheless recommend it, we have to inspect the source of the apparent plausibility of its rival; we shall try to indicate that this plausibility is dubious.

Carnap’s triadic classification is based on a picture which is very natural: on a picture of language as a ‘nomenclature’ (as I called it elsewhere – see, e.g., Peregrin, 1995, Chapter 8), i.e., as a set of labels conventionally attached to certain

⁹ In fact, this position is close to that of Carnap before he embraced what we call the Carnapian paradigm. See Carnap (1934).

extralinguistic entities. What makes up language in the first place is, then, the linkage between its signs and some things which the signs *stand for*, and it is the theory of this linkage which is the subject matter of Carnapian semantics. This theory is then supplemented, on the one hand, by a theory of the idiosyncratic nature of the signs themselves; and, on the other hand, by a theory of how the signs are employed by human agents. (It is unnecessary to add a specific theory of the entities which the signs stand for, because these are supposed to be ordinary, non-linguistic things falling under general theories of concrete or abstract things.) The two other theories, syntax respectively pragmatics, may be considered as secondary to semantics: in so far as something qualifies as a language simply by its elements standing for their meanings, to analyze this 'standing for' relation is to analyze what is really essential. Pragmatics is then, and this was as Carnap indeed seemed to see it, a not very interesting matter of the idiosyncratic ways speakers employ words and sentences when they *use* language (what they feel and imagine when using its expressions, etc.). And syntax, although surely interesting in its own right, is inessential in the sense that language could fulfill the same function even if the idiosyncratic syntactic features of its expressions were quite different – provided the 'standing for' relation were retained.

I can see two main reasons leading Carnap to his triad (if we disregard the support it gains from its accordance with common sense): firstly that it is straightforward for artificial, formal languages, and secondly that it accords with the doctrine of logical atomism which tacitly underlaid the philosophical views of the majority of logicians and analytical philosophers of the first half of the present century.

Formal languages of logic have been usually defined by defining their syntax and semantics: syntax established how their formulas were to be formed and 'reformed' ('umgeformt', in Carnap's, 1934, German term), whereas semantics established what the formulas and their parts were to stand for. (In his 1934 book, Carnap's intention was to make do with syntax only, but later, especially under the influence of Tarski's development of 'scientific semantics', viz. Tarski, 1936, he fully embraced also the set-theoretically constructed semantics.) These two compartments of the theory of language had to be complemented, Carnap obviously thought, by a third one which would comprise everything that could not be directly subjected to logic – i.e., matters concerning the idiosyncratic ways people actually employ language.

That applying this view also to natural language well accorded with the doctrine of logical atomism is not hard to see. The doctrine, explicitly entertained by Russell (1914, 1918/19, 1924), but implicitly endorsed also by Wittgenstein (1922) and Carnap himself (1928) is based on seeing the language and the world as edifices erected upon certain atomistic bases; and seeing the link between language and the world in terms of an *isomorphism* of the edifices: what a complex statement (a *logically* complex, that is, for what really counts is the *logical* structure, which can be covert, not the superficial, overt structure) stands for is a certain conglomerate of that which is stood for by its parts (see Peregrin, 1995, §5.6).

However, I think that none of the reasons for the Carnapian paradigm is to be embraced; albeit the grounds for rejecting them are quite different. The reason stemming from the analogy between natural and formal languages is to be rejected because the analogy does not really exist; while the reason of atomism is to be rejected because the atomistic doctrine failed. Let us first turn our attention to the failure of atomism first.

3.3. 'The dismantling of atomism'

That the atomistic picture is far too naive to underlie an adequate account of the language-world relationship soon became clear. It is interesting that Wittgenstein, whose *Tractatus* offered probably the most philosophically fruitful elaboration of the atomistic picture, himself early recognized its weak points; and what took place in his thinking since 1929 is aptly called, by Kenny (1972), 'the dismantling of atomism'. It is instructive to consider the reasons for this dismantling.

The basic point was that Wittgenstein realized that the assumption of a basis of atomic statements underlying our language (and hence of a basis of atomic facts laying the foundations of our world) has no true support in reality. The constitutive feature of such a basis is the independence of its elements, i.e., the fact that each of them can be true or false independently of the truth or falsity of any other. However, when Wittgenstein examined more closely the most basic sentences of natural language, especially the ascriptions of colours which appeared to be exemplary cases of elementary statements, he realized that they are far from conforming to this picture. Such sentences, although constituting the most 'primitive' level of our language, are clearly not independent of each other: *x is blue*, for example cannot be true if *x is red* is (assuming, of course, that *x* is not a kind of object which can be *both* blue and red; viz. the well-known Sophists' argument criticized by Aristotle). Thus we have either to conclude that such statements are still *not* atomic, that they are compounds of some other, more primitive statements, whose nature is then, however, unavoidably mysterious (they are surely not statements of the overt language), or we have to give up the whole picture of an atomic basis. Some of the passages of the *Tractatus* indicate that Wittgenstein was at least dimly aware of this predicament already while writing this book and tried to resolve it in the former way, by indicating that his theory addresses some hidden structure underlying natural language rather than the language itself, which in fact immunizes his theory against any findings about real language. What he realized later was that a theory of language of this kind is nothing else than another kind of infallible metaphysics (just *because* of its immunity from any findings about the real language) which he himself always struggled to eradicate.

However, considerations of the ascription of colours and of the nature of atoms of our language were neither the sole, nor the most decisive, reason for Wittgenstein's later change of mind. The crucial factor appeared to be the realization of

the fact that to see meanings as things and their relation to their expressions as correspondence is both unwarranted and futile. Meanings, as Wittgenstein clearly saw in the later period of his life, are best seen as ways of usage, not as things named.

Quine, Davidson, Sellars and other American (post)analytic philosophers later came with related critique; although sometimes put in rather different ways. Quine pointed out that atomism breaks down once we appreciate the essentially holistic character of our language, which becomes evident when we consider, e.g., the process of translating an unknown language or the process of verifying scientific hypotheses. (This led him also to his famous claim that we cannot keep positing an insurmountable hedge between truths which are analytic and those which are contingent.) Sellars' criticism is similar, although originally based predominantly on considerations of the nature of our knowledge and resulting in the rejection of the boundary between 'the given' and 'the inferred', implicit in the atomistic picture as the boundary between the knowledge of atomic facts (which is direct, we simply 'accept such facts into our minds') and of facts that are complex (which we then fabricate out of the direct intake). Given all this, it becomes less easy to see language as a collection of expressions each of which mirrors its own particular bit of the world independently of the others.¹⁰ Moreover, it almost inevitably leads to the view of meaning as a tool employed by an interpreter to comprehend language via classifying its elements.¹¹

However, if this is the case, then the Carnapian triadic division of linguistic matters becomes dubious. From this visual angle, it may seem as if pragmatics swallows up everything else. Everything that we learn when we decipher a language (and hence everything that there is to know in order to know the language) is how the speakers of the language use it. If language is no nomenclature, if meaning is only a classificatory tool of an interpreter, then there is no sharp boundary between those aspects of linguistic behaviour which are to be viewed by the prism of meaning and those which are not. We posit meaning where we see it helpful; and we do not posit it where we think we can make do without it.

3.4. *Natural and formal languages*

It is clear that there is no difficulty in separating semantics from syntax and pragmatics *in a formal language*. In fact, it is usual for an exposition of such a language to be given in three sharply separated chapters: syntax proper (delimiting well-formedness, i.e., the class of the expressions of the language), proof theory or 'logical syntax' (delimiting provability, i.e., the class of the theorems of the

¹⁰ This has been discussed in detail by Rorty (1980).

¹¹ This is stressed by Sellars (1974), who speaks directly about "meaning as functional classification". Elsewhere (see Peregrin, 1995, 1997a) I have pointed out that this means that any theory of meaning has to be 'structuralistic'.

language) and model theory or semantics (delimiting validity, i.e., the class of tautologies or analytic truths of the system). Each chapter constitutes its own self-contained field of study. The first two may be combined, following Carnap, under the common heading of *syntax*, while the third is left under that of *semantics*. *Pragmatics* then may be considered as not a matter of the system itself, but rather of the way in which the system is handled by those who employ it.

It is beyond doubt that the development of languages of modern logic advanced our understanding of natural language. It is also true that these languages can often be, beneficially, conceived of as models of natural language. Nevertheless, we should be careful in concluding that therefore the nature of formal and natural languages is the same: after all, although any model must be in some sense similar to what it models, the very fact that it is capable of serving as a *model* means that it is also, in some other sense, quite *dissimilar* to it. If we want a model of an atom, then we cannot simply take another atom, we have to make a metal (or plastic, or whatever) construction, which is in some important aspect ('structure') similar to the atom while in some other aspect (scale) utterly dissimilar.

It is the neglect of this important point that leads to pronouncements such as Montague's denial of any important difference between natural and formal languages, and it was the very same neglect that underlaid Carnap's approach. (To avoid misunderstanding: of course there *is* a sense in which we *have to* neglect the differences between the model and that which it models. Such neglect underlies the very employment of the model as a means of reasoning about the modeled. What we want to say is that if our aim is to account for the very relation of modeling and its terms, then we have to reflect their essential asymmetry.) The idea was that we could get syntax by studying the system of signs itself, semantics by studying on which things its individual signs hook, and pragmatics by studying how the signs get employed by their users. However, as Quine and Davidson demonstrated with their thought experiments of radical translation resp. interpretation, *to observe which expressions speakers employ and how they employ them is all there is to observe and all there is to understand*; there is no observing of how words hook on things over and above this.

However, this looks like an evaporation of semantics: there are matters of which expressions constitute language, i.e., which expressions are well-formed, which undoubtedly fall under the heading of syntax; and there are matters of how their users employ them, which appear to fall under that of pragmatics. There appears to be no room for an intervening semantics. Does this mean that natural languages have in fact no semantics (but only pragmatics) and that formal languages, in force of having one, are inadequate to them? Of course not: it only means that the Carnapian division may not be applicable to natural language so straightforwardly as many seem to think; that it may not be a matter of the phenomenon studied (natural language), but rather of our way, or our means, of studying it (the formal language model).

We should not be blind to the fact that natural language itself does *not* come in the three chapters in which formal languages do; we make it look so only when we devise a suitable formal language as a model, as a prism through which we look at it. (And note that doing this is not cheating, it is simply imposing an organizatory scheme which promotes our understanding.) In applying the model, we do our best to make it fit, to make all junctures of the latter be precisely superimposed on the corresponding junctures of the former. However, there are no natural junctures to be superimposed by the formal boundaries of Carnapian semantics, and so we have a certain latitude over our placing of it (we can move it here and there to the extent to which it does not pull other junctures which do have natural counterparts to superimpose).

Hence, it is crucial not to confuse the (natural) language which is the *object* of our investigation with the (formal) language which is a *means* of the investigation. As Putnam (1962) puts it, discussing the problem of the analytic/synthetic distinction, “we have a model of natural language according to which a natural language has ‘rules’, and a model with some explanatory and predictive value, but what we badly need to know are the respects in which the model is exact, and the respects in which the model is misleading The dispositions of speakers of a natural language are not rules of a formal language, the latter are only used to represent them in a certain technique of representation; and the difficulty lies in being sure that other elements of the model, e.g., the sharp analytic-synthetic distinction, correspond to anything at all in reality.” The same holds for the boundaries of Carnapian semantics: they are boundaries essential (and straightforward) for formal languages, but rather chimerical for natural languages. The problem is that we are so accustomed to viewing natural language through the prism of its formal-language model that we often mistake the latter for the former.

3.5. *Meaning as ‘interpretational construct’*

In order to fully understand the Davidsonian paradigm, we must break radically from viewing language in the Carnapian way. We must forget about ‘standing for things’; we must stop construing expressions like labels and instead see them as ‘tools’. To learn the meaning of a word is no longer to discover the thing (or the chunk of reality, or the thought) which the expression labels, but rather to learn the ways in which the expression is used within its ‘language game’. If it is not a word of our first language, then this usually involves finding a word or phrase of ours which is employed in the same way as the foreign word in question; to find the component of *our* toolbox with which we achieve (more or less) the same as the foreigners achieve with that element of *their* toolbox. Thus, from this perspective, translating a foreign language does not consist in finding the things which are the common nominata of the foreign and our words, it rather consists in something like comparing toolboxes.

However, if we took this idea at face value, would it not lead to absurd consequences? If we took the meaning of an expression to consist in the totality of cases in which the expression is really put to use, would it not mean that meaning is something which we can never really learn (for we surely cannot witness all the cases), and, moreover, something too idiosyncratic to an individual speaker? Would it not mean that we could almost never find an expression of the foreign language which would mean the same as an expression of ours? (It would be enough if my foreign informant once mistook a cat for a rabbit, while I did see it was a cat, and his *gavagai* would be bound to mean something else than my *rabbit* – no matter how many other times we would use the two words concurrently.)

The answer is that, of course, we cannot see meaning as consisting in *all* the cases of utterance. It is clear that we have to allow for marginal discrepancies in usage and not to construe meaning as the *entire* way an expression is actually put to use, but by something as ‘the most substantial part of this way’.¹² However, having given up the notion of language as a nomenclature, we cannot say that this ‘most substantial part’ is simply that part which is the matter of the expression’s ‘standing for’. Is there another feasible way of delimiting it?

We may think of identifying the boundary of the ‘most substantial’, ‘meaning-determining’ part of an expression’s functioning with the boundary between *the analytic* part of language and *the synthetic* part. Some statements, it is usually assumed, are analytic and meaning-constituting (hence they are, in effect, explicit or implicit definitions), others are synthetic and fact-expressing (they are reports of how things are). However, this way is in general precluded to us too – for as Quine (1952) has famously pointed out, even this boundary goes by the board with the notion of language as a nomenclature.¹³

This brings us to the central point of Quine and Davidson: linguistic holism. Language is a co-operative enterprise, and its working cannot be construed as a resultant of self-standing workings of mutually independent items. Let us imagine

¹² Besides this, we must realize that the fact that our conjectures about the ways the foreigners use their words are bound to be based on restricted evidence (for we can realistically witness only a severely limited subset of the cases of their utterances) is not an argument against knowing them. Drawing general conjectures from restricted evidence is the general way we put together our theories of our world, and we know that they do work despite this (although we must grant Hume and Popper that we can never be *sure* that our general theories are really true). So in this respect, our learning of foreign language is no more problematic than finding out about anything else within the world.

¹³ In fact, once we assume the Davidsonian stance, the same conclusion is bound to be forthcoming. Observing the natives, how could we tell an analytic pronouncement from a synthetic one? How could we tell difference in meaning from difference in claims? Suppose that the foreigner whose language we think we have translated into our language satisfactorily utters a sentence which we translate as ‘Pigs have wings’. How could we decide whether he really believes that pigs have wings, or whether we have only misinterpreted some of the words? Of course by asking him questions about pigs and wings (and indeed about having) to find out to which extent what he says differs from what we think – and if the differences are deep, we would be inclined to vote for an error in our translation manual, while if they are not, we could vote for differences in opinions. However, there is no criterion to draw a sharp boundary.

a clock: it shows time, and it does so by consisting of a number of co-operating parts. However, it would be futile to see its parts as carrying out each its independent subtask of time-showing, and to claim that the working of the whole clock is the resultant of such individual subtasks. Of course there are ways to specify *the role* of a part of the clock, but we can usually do so only relatively to the roles of other parts; and we can do it in more than one way. Is the role of the clockface simply to show the layout of the hours of the day; or to underlie the hands, or perhaps to give meaning to the positions of the hands? And is the role of the predicate to apply to its subject; or rather to let the subject be applied to itself; or perhaps something else?

This indicates that meaning, viewed from this perspective, becomes something as an 'interpretational construct'.¹⁴ Assigning meaning is specifying a role, or possible roles, within a co-operative enterprise; it is to state how an expression could be useful for the purposes for which we use language. Thus, assigning a meaning to a word is not like discovering a thing effecting the word, but rather like the determination of a value which the word has from the viewpoint of a certain enterprise.

When a speaker *S* utters a statement *s*, then our way of perceiving it is that *S* has a belief *b* and that this belief is the meaning of *s*. However the belief is not something that could be found by opening *S*'s head, and similarly the meaning is not something that could be found by inspecting *s*'s linkage to a piece of the world; both are something we stipulate to 'make sense' of *S*'s utterances. We start from the observed facts about the speakers' linguistic behaviour and 'decompose' the body of these facts into a theory of what the speakers believe and a theory of what their words mean. Thus we are to understand the pronouncement 'the meaning of *s* is such-and-such' more or less as only a metaphoric expression of 'the way *s* gets employed within a certain language game is substantially such-and-such' or 'the position of *s* within a certain language is substantially such-and-such'; just as we understand the pronouncement 'the price of *x* is such-and-such' as being a shorthand for 'the position of *x* within the selling-and-buying relations among people is such-and-such'.

3.6. *'Semantics must answer to pragmatics'*

While Davidson's own writings do not pay much attention to the concepts of pragmatics and semantics, an explicit reflection of these concepts and their relationship is fostered by the writings of Wilfrid Sellars and carried out in detail by Sellars' disciple Robert Brandom. Brandom (1994, p. 83) diagnoses the situation in the following way: "Semantics must answer to pragmatics. The theoretical point of attributing semantic content to intentional states, attitudes, and performances is to

¹⁴ Cf. Abel (1994).

determine the pragmatic significance of their occurrence in various contexts". According to him, the talk about the meaning of a statement is a disguised (sometimes quite misleadingly disguised) talk about what the statement is good for, and the talk about the meaning of a part of a statement spells out the contribution which this expression brings to the usefulness of those statements in which it may occur. "Semantic contents corresponding to *subsential* expressions", as Brandom (1994) puts it, "are significant only insofar as they contribute to the determination of the sorts of semantic contents expressed by full sentences".

Following Sellars, Brandom moreover stresses the essentially *normative* nature of pragmatics: pragmatics, as he understands it, is essentially a matter of *norms*: it is a matter of *rules* which institute what is *right* and what is *wrong* within the realm of usage of language. According to him, the meaning of a statement, i.e., what the statement is good for, consists first and foremost in the *commitments* and *entitlements* which the assertion of the statement brings about, and these commitments and entitlements are in turn reflected by the inferences in which the statement participates. Thus, the meaning of a statement is, according to Brandom, its *inferential role*.¹⁵

In this way any 'semantic interpretation' is merely a spelling out of the 'pragmatic significance': "It is possible", writes Brandom (1994, p. 84), "to associate all sorts of abstract objects with strings of symbols in formalized languages, from sets of models to Gödel numbers. Such an association amounts to specifically *semantic* interpretation just insofar as it serves to determine how those strings are correctly used. For example, Tarski's mapping of well-formed formulas of the first-order predicate calculus onto topological domains qualifies as a semantic interpretation of them only because he can derive from it a notion of valid inference, a way of telling what follows from what – that is, a notion of their correct use".

Thus, I think that Brandom's book, appropriately called *Making it explicit*, offers the clearest exposition of the pragmatization of semantics implicit to what we have called the Davidsonian approach: it makes explicit that once we give up the notion of language as a nomenclature, there is no way to extricate semantics from pragmatics.

4. New boundaries?

4.1. *Semantics and syntax*

The considerations of the previous sections have posed serious challenges to the Carnapian paradigm and to those boundaries between syntax, semantics and pragmatics on which this paradigm is based. However, their upshot should not be that there are no such boundaries, but rather that the Carnapian way of drawing them is

¹⁵ Cf. also Peregrin (ta1).

inadequate. Let us first look at what separates semantics from syntax; we shall denote the Carnapian notions as *syntax_C* and *semantics_C*. Thus, *syntax_C* is supposed to be about relations between expressions, whereas *semantics_C* is supposed to be about those between expressions and extralinguistic objects.

It is clear that this definition makes real sense if there is a *matter of fact* underlying the distinction between properties of expressions and relations linking expressions to extralinguistic objects, i.e., if those relations between words and things which are the subject matter of semantics are in some sense 'real'. Given the atomistic character of the language-world relationship and assuming a 'real', 'matter-of-factual' link between a thing and that expression which denotes this thing, the boundary between syntax and semantics becomes an *empirical* matter. It is like a boundary between relations among trees in a forest (e.g., 'a tree T_1 is bigger than a tree T_2 ') on the one hand and relations between trees and men taking care of the forest (e.g., 'a tree T has been planted by a man M ') on the other. To ascertain which properties of a tree are of the former kind (i.e., which are 'natural') and which are of the latter kind (i.e., which are caused by an extraneous agent) is the matter of an empirical inquiry: it is in principle possible (though, as the case may be, in practice difficult) to find out whether, say, a scratch in the trunk of a tree is 'natural' or whether it was caused by an action on the part of a forester. And it would seem likewise possible to ascertain which aspects of an expression are 'natural' and which were caused by an external agent – its meaning.

However, if we relinquish the notion of language as a nomenclature and embrace the ensuing holism, this boundary – just like the boundary between the analytic and the synthetic – ceases to be directly grounded in the nature of things and becomes – in this sense – rather visionary. Once we deny the possibility of empirically discovering the factual link between an individual expression and its meaning, then we must accept that there is no real boundary at all. Once meaning becomes an 'interpretational construct', there ceases to be an absolute boundary delimiting the cases of its employment. Whenever we have an expression E having a property P (a *syntax_C* matter), we can treat P as an object associated with E (i.e., as a *semantic_C* matter). On the other hand, whenever there is an object O associated with an expression E (a *semantic_C* matter), we can speak about E 's having the property 'being-associated-with- O ' (i.e., view it as a *syntax_C* matter).

Let us take an example. What does it mean for a statement to be true? *To be true* is surely a property; but we can just as well articulate it, as Frege did, as the relation between the statement and a posited extralinguistic object ('the truth'). If we do nothing more than reify it in this way, then we surely do not do anything substantial; however, we stop speaking about a property of expressions (i.e., about a unary relation and hence about a *syntax_C* matter) and start instead to speak about a relation of the expression to an extralinguistic object (a *semantic_C* matter). Another example: Let us take the statement *A man walks and he whistles*. We say that its part *a man* and *he* refer to the same object – which amounts to speaking about a relation between words and a thing. However, the situation can be equally

well accounted for by saying that the statement in question is synonymous with the statement *A man walks and the (same) man whistles* – and we are talking about a relation between two statements to the same effect.¹⁶

This leads to the conclusion that the nature of the syntax/semantic boundary is quite similar to the analytic/contingent boundary – that both rise and fall with the atomistic view of language. This is, indeed, true – however only if we keep with the Carnapian definition drawing the boundary as that between relations linking words to words and relations linking words to things. It is not true if we construe the syntax/semantics boundary along different lines.

The basic intuition underlying our employment of the pre-theoretical concepts of syntax and semantics is that there is a distinction between questions concerning words *per se* and questions concerning words-as-meaning-what-they-mean. However, this intuitive distinction is misconstrued by the Carnapian definition: ‘to be about’ is not a naturalistic matter of ‘hard facts’, it is rather the matter of interpretation and hence cannot mark a distinction which would be absolute. The right way to construe the intuitive syntax/semantic distinction is another, and if we adopt the Davidsonian stance, it is rather straightforward. It takes the distinction as marking the boundary between *what* we use to communicate and *how* we use it. Thus, we suggest to consider syntax as the theory of *which* expressions people use to communicate (i.e., a theory of well-formedness), while semantics¹⁷ as the theory of *how* they use them.

The boundary between syntax and semantics conceived in this way is surely an existing and observable one: to delimit the range of expressions encountered by the natives is one thing, and to describe when and how they employ them is another (though the former may be thought of as a prerequisite for the latter).¹⁸ However, it is a boundary substantially different from the Carnapian one: what Carnap called *logical syntax* now falls on the side of *semantics*, not on the side of syntax – for inference is clearly a matter of *how* statements are used. It is nevertheless precisely this which it takes to gain a solid and real boundary.¹⁹

¹⁶ The situation is reminiscent of the old philosophical question about the reality of *universalia*: it is clear that if the question is simply whether *to be red* is to have a property, or rather be connected to an object (‘redness’), then it is a pseudoquestion.

¹⁷ Here we, of course, use the term *semantics* broadly, in the sense of *semantics-cum-pragmatics*. How to separate these two ingredients will be the subject of the next section.

¹⁸ The former task amounts to formulating some recursive rules characterizing the class of well-formed expressions, whereas the latter amounts to articulating relevant likenesses and differences between expressions (between the foreign expressions as well as between them and our expressions). Quine (1953, p. 49) puts it in the following way: “What had been the problem of meaning boils down now to a pair of problems in which meaning is best not mentioned; one is the problem of making sense of the notion of significant sentence, and the other is the problem of making sense of the problem of synonymy.”

¹⁹ To indicate the consequences of the shift, let us consider the concept of *provability*. Carnap would count it to (logical) syntax, for to prove something is a matter of applying some ‘reformation’ rules transforming statements into other statements; and so would undoubtedly also many of the contempo-

4.2. Semantics and pragmatics

In this way we have managed, after all, to draw a clear and distinct dividing line between syntax and semantics (or we should rather say between syntax and the rest, i.e., semantics-cum-pragmatics); albeit differently than Carnap. However, what about the opposite boundary of semantics, that which delimits it from pragmatics?

We have seen that the considerations of the ‘external challengers’ indicate that we could or should see meanings as ‘ways of usage’, ‘inferential roles’ or some other usage-based creatures; and that those of the ‘internal challengers’ suggest that we can no longer find an adequate theory of meaning without employing the concept of context (or some equivalent). Is there still room for distinguishing between meanings and ways of putting to use?

I think there is; but again, to find it we should better forget about the Carnapian paradigm, for seeking a boundary between ‘hooking on things’ and ‘being employed by speakers’ can give us no cue. What I suggest is that we should attend to the concept of *invariance*: Meaning of an expression is, roughly speaking, that which is invariant among various cases of employment of this expression. (Interestingly, this is what was urged by Roman Jakobson as the core of linguistic structuralism: “If topology is defined as the study of those qualitative properties which are invariant under isomorphic transformations, this is exactly what we did in structural linguistics”.²⁰) This is obviously a very abstract and perhaps ambiguous specification, for there can be various *kinds* of invariances; but what has been concluded above indicates that we should *not* see the boundary between semantics and pragmatics as altogether unambiguous. (Thus the status of this boundary is essentially different from that of the boundary between semantics and syntax – we found, in the end, that syntax *can* be delimited quite unambiguously.)

Let us hint at what kind of invariances we may have in mind: On one level, semantics may be held to be that which is invariant to individual utterances of the same expression, pragmatics as that which is not. Thus, when I say *I am hungry*

rary logicians. But it is important to see that this usage institutes an ambiguity of the word ‘syntactic’: *to be provable* is *not* syntactic in the sense in which, say, *to begin with the letter ‘a’* is – it is not a property of statements *per se*, i.e., statements as sequences of marks on a paper, but rather of statements as meaning something, as used within a certain language. *To be provable* primarily means *to be demonstrably true*, or *to be the result of recursive application of some obviously truth-preserving inferential rules to some obviously true statements* (only secondarily is it sometimes used also within the context of formal languages in the sense of *to be the result of recursive application of whatever counts as inferential rules to whatever counts as axioms*). It clearly makes no sense to say whether a sentence is provable unless it means something (whereas we *can* say whether it begins with ‘a’ even so). (Of course we can be given some instructions with the help of which we can identify some provable statements even without understanding them, but this is equally true for *any* property of expressions, however purely semantic it may be.) The boundary proposed here does away with this ambiguity: proving is clearly a matter of what statements mean, i.e., how they are *used*, so provability now falls on the side of semantics.

²⁰ Jakobson (1971, pp. 223–224).

and you say *I am hungry too*, the fact that the first *I* refers to me, whereas the second to you, is a pragmatic matter. What is invariant is that it always refers to *the speaker*. On another level, we can see semantics as that which is invariant to the idiosyncratic ways individual speakers employ words, and pragmatics as that which is not. The fact that it is true to say *I am hungry* when one is hungry is a matter of semantics; while the fact that I never utter the sentence when I am in somebody else's place, whereas someone else does unscrupulously announce her hunger even in such situations is a matter of pragmatics. Similarly, the fact that I always imagine a roasted boar when I say that I am hungry, whereas my companion imagines the emptiness of her belly, and somebody else imagines nothing at all is the matter of pragmatics: what is invariant is the very utterance and the norms governing it. Of course all such boundaries are fuzzy: but this is of a piece with the conclusion that meaning should not be seen as a thing, but rather as an interpretational construct.

In Section 3.5 we concluded that assuming the Davidsonian stance implies taking the meaning of an expression as the 'most substantial part' of the way the expression is being put to use; and we stressed the important fact that the boundary is thus not 'in the nature of things', but is, in an important sense, in the hands of the interpreter. Now the idea of invariance indicates that the interpreter at least has some cues what to count to the substantial part and what not – the interpretation is, in effect, nothing else than a case of the old pursuit of the *e pluribus unum* which seems to be the basic pattern of our grasping the world.

4.3. Objections

The proposals made in the previous sections will, no doubt, be felt by many people as counterintuitive. Here I shall try to indicate that this feeling may be the result of, to paraphrase Wittgenstein's (1953, §115) bonmot, 'being held captive by the Carnapian picture', rather than the insufficiency of the proposal. Let us consider some of the possible objections to it.

Perhaps the most obvious objection is that the new picture fails at doing justice to the most basic 'semantic intuition', namely that words *are* a matter of labeling things. Is, say, the word *cat* not a label used to label cats? Does it not fly in the face of reason to deny that, say, the name *the cat which chases Jerry* is the label of Tom?

I think that this 'semantic intuition' is in fact a malign (i.e., misleading) mixture of various heterogeneous, more or less benign (i.e., just), intuitions. First, it is obviously true that some expressions are intimately connected with some kind of objects (viz. *cat* with cats) in the sense that the way we use them would be hardly specifiable without mentioning (or indeed pointing at) objects of this kind. However this hardly establishes a name-like relation. For a general term like *cat* it holds that if we want to treat it as a name of an entity, then this entity would,

of course, have to be not a cat, but rather something as a ‘cathood’. However, as millennia of disputations of philosophers have made plausible, ‘cathood’ seems to be nothing else than an entity brought to life precisely only by our desire to have something for *cat* to name – and hence can be hardly taken as something which prompted us for being labeled by the word.

If we, on the other hand, consider a singular term like *the cat which chases Jerry*, then it is true that the term can be seen as naming an object, but it is notoriously well known that the object has little to do with the *meaning* of the phrase: you can surely know the meaning of the phrase without knowing Tom (or even without knowing whether there really is any such cat). This fact has been clearly analyzed, for the first time in the modern context, in Frege’s (1892a) famous *Über Sinn und Bedeutung*. Thus it seems that whereas using language may involve various kinds of relations which may be seen in terms of labeling, it does not follow that the word-meaning link is one of them.

Another objection might be that if we give up the good old notion of semantics as semantics_C, we will not be able to explain truth. If we do not see words as essentially denoting things, then we cannot say that a statement is true if things are the way the statement declares them to be. Language, the argument may continue, is the matter of a words-things relation, so an explanatory account of language must be semantic_C. This objection is, of course, question begging – it simply presupposes the view of language as a nomenclature which we have eschewed as inadequate. Our Davidsonian stance implies that language is primarily *not* a collection of word-thing relations, but rather a collection of human actions and rules for such actions; and also that truth neither needs, nor admits, an explanation in terms of correspondence. (*How* truth is to be explained in such a case is another question; but proposals are numerous. See, e.g., Peregrin, ta2.)

Then there are objections which are likely to come from logicians. One such may be that if we give up semantics_C, then we shall not be able to give truth conditions for quantifiers – for the substitutional view of quantification is usually considered as unsatisfactory. We cannot give the truth conditions for $\forall x.P(x)$, this argument says, otherwise than via amounting to those things which *P* can be considered to apply to, namely as *P applies to every individual*. If $\forall x.P(x)$ is understood as an expression of a formal calculus (e.g., of the first-order predicate calculus), then there is no problem: formal languages do have their explicit model theories and nothing that has been said here can prevent them from keeping them. On the other hand, if $\forall x.P(x)$ is taken to be not an expression of a formal calculus, but rather a mere regimentation of a natural language phrase, then there is – anyway – no nontrivial way of stating its truth conditions over and above repeating or rephrasing the sentence itself – for an utterance like $\forall x.P(x)$ *iff P applies to every individual* de-schematizes to the trivial *Everything is P iff P applies to everything*. (For details see Peregrin, 1997b.)

However, the objection which most logicians would be likely to take as the most crucial is that, as Gödel proved, we need semantics_C in order to make any sense

whatsoever of some theories. Some theories, it is claimed, such as arithmetic, are not axiomatizable, we can specify them only model-theoretically; and this is taken to mean that the very 'grasp' or 'apprehension' of these theories (on our part) must be based on semantics_C. A thorough discussion of this problem would exceed the bounds of the present paper; so let us only note that the key is again in carefully distinguishing between formal and natural languages. We have very little to say about formal theories in formal languages; that the class of theorems of formal Peano arithmetic is not complete is a mathematical fact (the fact that a certain formally constructed set has a certain property), and nothing which has been said here is meant to interfere with this kind of truth of mathematics. On the other hand, if Gödel's results are interpreted as stating that there are truths which are accessible only semantically_C, then this is hardly true: there *does* exist a proof of Gödel's undecidable sentence (its truth is easily demonstrable to any adept of mathematical logic by means of a gapless chain of reasoning), albeit it is a proof which cannot be, curiously enough, squeezed into a single formal system.²¹

5. Conclusion

The 'external challengers' have disputed the view that expressions are basically names which stand for their nominata; they have done so by looking at language 'in action'. They have concluded that what makes an expression 'meaningful' is not a thing for which it would stand, but rather the fact that it can serve as a tool of communication – that there is a way we can use it for certain communicative purposes.²² Thus, meaning is better not seen as an object, but rather as something as a *role* or a *value*, a reification of the way in which its expression is useful. The 'internal challengers' keep explicating meaning as a (set-theoretical) object, but they have made it plausible that if we want to account for the riches of natural languages, then this object is bound to become something which is no longer reasonably seen as a real 'thing', it is again more a reification of the way the corresponding expression 'works', i.e., in which it alters the context into which it is uttered. In this way, the two challenges seem to be almost complementary expressions of what I called the pragmatization of semantics.

The Carnapian trichotomy which has underpinned, explicitly or implicitly, our grasping of language for much of this century, should be reassessed: it is a product

²¹ The reason is that the proof requires switching from reasoning on the 'object level' to reasoning on the 'metalevel'. See also Dummett (1963) who duly points out that the nature of Gödel's discovery is rather obscured by the talk about models.

²² The fact that we have concentrated on the Davidsonian approach, which we consider as the most penetrating, should not conceal the fact that the repudiation of the 'language as nomenclature' notion is a much broader matter. It is for example surprising to see how close, in this respect, Chomsky (1993) appears to be to the Davidsonian view – despite all the grave differences between his and Quine's or Davidson's view of the nature of language.

of a particular, now rather outworn, philosophical doctrine, and of the unscrupulous assimilating of natural language to formal ones. This paradigm played a positive and a stimulating role for some time, but now it seems to be more misleading than fruitful.

The new paradigm which grows out of the writings of various recent philosophers, linguists and logicians is the paradigm of language as not a nomenclature, but rather a toolbox. Whereas Carnapian theories saw a theory of language as consisting of *syntax* (the theory of relations between expressions and expressions; further divisible into *syntax proper* and *logical syntax*, i.e., *proof theory*), *semantics* (the theory of relations between expressions and things) and *pragmatics* (the theory of relations between expressions and speakers), this new, Davidsonian theory of language, the usefulness of which has been urged here, envisages a theory of language partitioned instead into *syntax (proper)* amounting to which expressions come into the language, *semantics*, amounting to the 'principal', 'core' or 'invariant' part of the way the expressions are employed, and *pragmatics* amounting to the remaining, 'peripheral' aspects of the way they are employed.

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CHAPTER 15

Does It Make Any Sense? Updating = Consistency Checking

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THE SEMANTICS/PRAGMATICS INTERFACE FROM DIFFERENT POINTS OF VIEW

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Most current semantic theories take the view that understanding what an utterance means involves constructing some sort of representation, 'anchoring' this in the situation of utterance, and hence creating a new context. I will argue that a number of awkward aspects of this notion can be neatly dealt with by assuming that the update step involves nothing more than verifying that the utterance makes sense.

1. Introduction

Most formal/computational treatments of natural language semantics discuss the production of formal paraphrases in some suitable language. There is some debate as to whether this can be done strictly compositionally, e.g., by function application and composition, as proposed in Montague grammar and its descendants (Dowty et al., 1981; Kohlhase et al., 1996), or by simple structure sharing (Pollard and Sag, 1988; Pollard and Sag, 1994; Fenstad et al., 1987); or whether it involves the construction of some intermediate, underspecified form (van Eijck and Alshawi, 1992; Milward and Cooper, 1994); or whether some more indirect construction process is involved (Dalrymple et al., 1996; van Genabith and Crouch, 1997). In nearly every case, however, it is understood that the end-point of the process is a formal paraphrase that 'means the same as the original'.

This belief that there is a single end-product that constitutes the result of the semantic analysis has a number of undesirable consequences. (i) It requires the use of a formal language with all the interesting properties of natural language. In particular, any such language must be 'dynamic' – it must express some relationship between situations, or states of affairs, or discourse states, or ... (ii) The formal paraphrase must contain all and only the information that is carried by the sentence. This will mean that the results of your analyses will be inflexible and overly precise, and considerable amounts of work will be required in order to choose between alternative 'ambiguous' readings.

In the current paper I want to explore the notion that the best way to see the significance of an utterance is by seeing what it entails *in the context in which it is uttered*. This provides greater flexibility, since some of the apparent content of an utterance will emerge from interactions between its literal meaning, the information embodied in general knowledge (about words and about the world), and information available in the current discourse situation. The cost is that I need to provide this background information, and that I need to show just how the consequences 'emerge' from such interactions.

The discussion below will centre on two major issues – the 'dynamic' nature of natural language semantics, and the interpretation of lexical items with 'light' semantics.

2. Updating = consistency checking

It is widely accepted that understanding what an utterance means involves constructing some sort of representation, ‘anchoring’ this in the situation of utterance, and hence creating a new context. The anchoring process may take many forms (Gazdar, 1979; Barwise and Perry, 1983; Heim, 1983; Kamp, 1984; Kamp and Reyle, 1993), and the creation of the new context will depend on the nature of the anchoring process. I want to return to Gazdar (Gazdar, 1979)’s treatment of these issues in terms of what each person knows, recasting his arguments as follows:

- much of the information contained in an utterance concerns the speaker’s view of what the hearer knows and believes, and of the knowledge that both parties share. This includes at least presuppositional constructs (including referring expressions), implicatures, words like *only* which deny beliefs which the speaker ascribes to the hearer, and connectives like *anyway*, *moreover*, ...
- when a hearer is presented with an utterance, their first task is to ensure that it makes sense. *This is all that is needed to complete the update step.*

The key to the latter claim is the fact that much of the information carried by an utterance concerns the speaker’s view of the hearer’s beliefs and of what they share. In particular, if the speaker’s view of the common ground is to be reasonable then it must be pretty similar to the hearer’s view of it. And the hearer’s view of the common ground is available to the hearer, and can be reasoned about.

To make computational sense of this claim, I need a theory of knowledge and belief and an inference engine capable of extracting implicit information about who knows and believes what from what has been said and what is in the context. It has often been argued that the kind of modal treatment of knowledge and belief arising from (Hintikka, 1962) and espoused by AI workers (Moore, 1984; Appelt, 1985; Cohen and Levesque, 1980; Cohen et al., 1990) is inappropriate for work in natural language, since it (i) assumes things like consistency, logical omniscience and logical blindness and (ii) fails to address the intensional issues that come with considering questions like ‘*Who is Tony Blair?*’ and sentences like ‘*I know who did the washing up*’. I will rather take the view that *any* set of propositions can form a belief set, and that it is possible to extend a belief set by judicious combination of information already contained within it (consistent sets are clearly better than inconsistent ones, but very few human beings have provably consistent belief sets. Very few of us, however, are paralyzed by the fact that our belief sets may entail all possible conclusions). In other words, a *theory* of belief should be couched in a language which allows you to treat propositions and properties as entities, and in which you can encode inference rules which obtain new propositions from old ones. Turner’s (1987) *property theory* is a good example of such a language.

The required inferential power comes from an adaptation of Manthey and Bry (1988)’s theorem prover for first-order logic so that it can be used with property theory and equality. I have described this extension of Manthey and Bry’s work elsewhere (Ramsay, 1995; Cryan and Ramsay, 1997). The key point for the cur-

rent paper is that the original version of this theorem prover works by adding the negation of the goal to the assumptions, as usual, and then enumerating the potential models to show that there aren't any. This can easily be adapted to enumerate the potential models of a putatively consistent set of sentences.

The hearer H's task when the speaker S utters U is thus

- Construct a representation of what U says about S's view of each participant's beliefs and their common ground.
- Demonstrate that this representation is consistent with H's own view of each participant's beliefs and the common ground by using the theorem prover to construct a model (essentially a Herbrand model).
- Take this model to be H's view of the new common ground.

Of course, this can go wrong or be abused in a variety of ways. Speakers can lie, hearers can get confused or can wilfully misunderstand, the whole process can get overloaded, and so on. But to say that speakers can lie is to admit that there is a notion of truth, and to admit that hearers can get confused is to admit there is something to be clear about. My goal in the remainder of this paper is to show how these three steps can be fleshed out to make simple cooperative discourses work. When, and only when, this has been done we can start to consider playful or indirect uses of language.

2.1. Anchoring

Assume, then, that meanings of natural language utterances have a dynamic, context-changing character. You produce an utterance in a context. Your hearer processes this utterance with respect to the context, doing things like anchoring referring expressions, choosing among alternative readings, and perhaps reasoning about why you might have said this, and thus updates his or her view of the world.

The anchoring effect of referring expressions has been discussed at least since (Russell, 1905). Most modern theories of semantics assume that such expressions somehow point into the discourse context (situation, ...) to pick up entities that the sentence is 'about'. Such theories generally provide new, dynamic, logics for dealing with this (see, e.g., (Groenendijk and Stokhof, 1991)).

The approach I will take involves introducing a special kind of term to play the same role in the formal paraphrases¹ as referring expressions play in the original natural language sentences. In essence these terms act as place-holders for individual constants. The conditions under which they can be replaced by such constants are spelt out below. The general notion is that a hearer can replace such a 'reference term' by a constant if they can show that the information they share with the speaker supports a certain kind of proof. The ontology of the underlying logic is unaffected by the introduction of such terms, but the proof theory does become slightly more complex.

¹ All the formal paraphrases in this paper are obtained from the system described in (Ramsay, 1996).

The formal paraphrase of (1) shows what such terms look like:

(1) *The man died.*

$$\begin{aligned} \exists C: \{C < \text{now}\} \\ \exists D: \{\text{aspect}(\text{perfective}, C, D)\} \\ \forall A: \{D.A\} \\ \text{type}(A, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{die}]) \\ \wedge \theta(A, \\ \text{agent}, \\ \text{ref}(\lambda B \text{type}(B, \\ ([\text{entity}, \text{concrete}, \text{solid}, \text{living}, \text{animal}, \\ \text{human}, \text{man}])))))) \end{aligned}$$

There are a few points to note about this paraphrase:

- The basic type of an item is captured by ascribing it a position within a natural kind hierarchy. Specifying the position within this hierarchy by describing the path down from the root makes it very easy to compare types – two type descriptors are compatible if one is a prefix of the other, and a type T_1 is a subtype of another T_2 if T_2 is a prefix of T_1 . These are matters that can be checked very easily and efficiently.
- The temporal information encoded by tense and aspect markers is captured by assuming that sentences report *sets* of events, and that aspect is a relationship between an event time and the set as a whole. I will return to this in Section 3.3. For now, I will just note that in the paraphrase given above of (1) this is covered by the introduction of an item C , which is marked as being before *now*, and hence must be an instant, and an entity D which is in perfective aspect with respect to C . What is D ? It is a set of ‘dying events’ – a set where each member A is an item of the specified type. I will use the notation $X.Y$ indifferently to say either that Y is a member of the set X or that the property X holds of the item Y . The two are in any case equivalent, since any set defines a property (namely its own membership) and any well-founded property defines a set (the set of items that satisfy it).
- The parts played by the entities referred to in a sentence are encoded by assigning ‘thematic roles’ to these entities. I will return to these in Section 3.4. For now it should just be noted that (Dowty, 1989, 1991) has shown just how careful you have to be when thinking about what specific thematic roles mean.
- The referring expression ‘*the man*’ has been replaced by a term, $\text{ref}(\lambda B \text{type}(B, ([\text{entity}, \dots, \text{man}])))$. This is, of course, pointless unless the way that such terms are interpreted is spelt out in detail. The remainder of the current section is devoted to this task.

Before we turn to the details of how to cope with referring expressions, I want to consider a much broader, and vaguer, question. What should a hearer do when confronted with an utterance?

Before you can act on what someone has said to you, you have to make sure it makes some sort of sense. For large parts of an utterance, that means checking that what has been said is compatible with your general knowledge. If I say '*My table died*', or even '*Colorless green ideas sleep furiously*', you will balk. '*My table died*' is odd because only living things can die, and tables aren't living. You will probably be able to come up with some metaphorical reading, for instance that all the legs collapsed at once, but you will have to be fairly creative. The sentence cannot be literally true, and the fact that it cannot be literally true is something you are immediately aware of.

How can you check it? The easiest way to see whether something makes sense is to see whether you can make a model of it. I am deliberately conflating the informal notion of a mental model and the technical notion of a structure that verifies a formula here. A mental model of the kind described by, for instance (Johnson-Laird, 1983), is clearly a structure which can be used for the technical task. Furthermore, there is an obvious parallel between Johnson-Laird's description of human reasoning and the activity of constructing a semantic tableau and inspecting the open branches, though most of the time people are not entirely systematic or reliable in the way they go about this task.

I shall therefore assume that when you want to ensure that something makes sense the best thing to do is to use some model building strategy to try to construct a view of the world which would make it true. Consider the sentence

(2) *A farmer owns a donkey*

The first thing to do when you encounter this is to see if you can make a model which combines the content of (2) and your general knowledge. If the formal paraphrase of (2) is

$$\begin{aligned} \exists A: \{ &type(A, [entity, concrete, solid, living, animal, donkey]) \} \\ \exists B: \{ &farmer(B) \} \\ \exists C: \{ &aspect(simple, now, C) \} \\ \forall D: \{ &C.D \} \\ &type(D, [entity, abstract, situation, event, own]) \\ &\wedge \theta(D, object, A) \wedge \theta(D, agent, B) \end{aligned}$$

then the first model that is found is as shown in Figure 1.

This model contains three things: a donkey called #3, a farmer called #4 and an extended event of the appropriate type called #0 which involves the farmer and the donkey. Various other facts about donkeys and farmers have been incorporated in this model, simply by forward chaining through such general rules as *most(X): {farmer(X)}man(X)* (I'm taking this as a default, using Reiter's (Reiter, 1980) notion that a default rule is something you can use unless you have evidence to the contrary).

This process of constructing a model is central to the current paper. When you hear a sentence, you try to see what the world would be like if it were true. You do

```

type(#0, [entity, abstract, situation, event, own])
θ(#0, object, #3)
θ(#0, agent, #4)

type(#3, [entity, concrete, solid, living, animal, donkey])
donkey(#3)
unsexed(#3)

type(#4, [entity, concrete, solid, living, animal, human, man])
farmer(#4)
male(#4)

```

Fig. 1. Model for (2) 'A farmer owns a donkey'.

this by exploring its consequences – what are owning events like, what do I know about farmers and donkeys, ... As we proceed, the information contained in a model will become more and more complex and detailed, but the general principle will remain the same. You use your understanding of the words in the sentence to extend your current picture of the world: your current view of what there is and what properties it has is your 'discourse model'.

Now consider

(3) *He beats it*

$$\begin{aligned}
 \exists A: \{ & \text{aspect}(\text{simple}, \text{now}, A) \} \\
 \forall B: \{ & A.B \\
 & \text{type}(B, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{beat}]) \\
 & \wedge \theta(B, \text{object}, \text{ref}(\lambda C \text{unsexed}(C))) \\
 & \wedge \theta(B, \text{agent}, \text{ref}(\lambda D \text{male}(D))) \}
 \end{aligned}$$

This contains two terms, $\text{ref}(\lambda C \text{unsexed}(C))$ and $\text{ref}(\lambda D \text{male}(D))$, corresponding to the pronouns *it* and *he*. How should we treat such terms?

To a first approximation, a speaker *S* will use a term like $\text{ref}(\lambda D \text{male}(D))$ under the following circumstances:

- (i) What *S* wants to say concerns some entity which *S* believes to be male.
- (ii) *S* believes that the hearer *H* also believes this entity to be male.

For a term like this to do its job, it will have to evoke the relevant entity for *H*. Just saying that something is male, however, is unlikely to do this. *H* will know of plenty of male individuals, and indeed of plenty of male individuals that *S* knows of. The point about a pronoun like *he* is that it doesn't just supply the information that the item in question is male. Implicit in the use of *he* is the message that *S* wants to pick out the male individual *who is currently under consideration*.

Currently under consideration by whom? Presumably by S and H. But for H to be able to determine which male S thinks is under consideration, H has to have a picture of what S thinks the conversation is about. And for S to decide that H will indeed get the right one, S has to be able to anticipate how H is going to react (which means, of course, that S has to think about what H thinks S thinks the conversation about). And then the question of why S thinks that H thinks that S has some entity in mind raises itself for H, and so on and on and on.

A common reaction to this apparent infinite regress is to posit an entity, the 'common ground', which is completely transparent to both S and H. There can, of course, be no such thing. The only way to obtain a genuine common ground would be via telepathy, with S and H each having direct access to each other's current view of the world. This never happens (or at any rate, it never happens in situations where S and H are conversing in natural language: what would be the point of using natural language if you had direct telepathic fusion?)

Instead we have a situation where each participant has a body of private knowledge, which includes their beliefs about the other person, and a view of the discourse itself. Now if things are proceeding smoothly, their views of the discourse should be fairly similar. There is no way of verifying that they are identical, but it is possible to exchange messages which ensure that things have not got too far out of step.

Suppose S believes that the discourse is about some male individual M . Then presumably S's view of the discourse state, which I will call $\Delta[S]$, should support the claim that there is a male individual, and that this male individual is central to what is being discussed. In other words, $\Delta[S] \vdash \text{male}(M)$ and there is no other individual M' such that $\Delta[S] \vdash \text{male}(M')$.

S cannot get direct access to H's view of the world. In particular, the individuals that populate H's picture are inaccessible, so there is no chance of seeing whether H knows about M . However, it is possible to communicate the fact that $\Delta[S] \vdash \exists X \text{male}(X)$; and of course since $\Delta[S]$ and $\Delta[H]$ are both supposed to be views of the common ground then they should be very similar, so that if $\Delta[S] \vdash \exists X \text{male}(X)$ holds then so should $\Delta[H] \vdash \exists X \text{male}(X)$. Likewise, if there is only one individual for whom $\Delta[S]$ supports a proof that they are male then there should only be one for $\Delta[H]$. Neither participant can get direct access to the specific individuals, but they can at least communicate about what sorts of proof they can each perform.

I therefore assume that a referring expression (definite NP, name, pronoun) carries with it an invitation to carry out a proof. When you are trying to assimilate an expression containing such an expression, you have to try to verify that you can indeed carry out this proof. Sometimes you will do so, and at the same time you will find that your view of the world already contains an individual satisfying the specified property. This will nearly always be the case with pronouns and proper names, but may not hold for definite NPs. Sometimes you will be able to carry out the proof, but you may not be able to point to a single entity already in your

model which satisfies the conditions. And sometimes you will simply not manage the proof at all. The three possibilities are illustrated in (4)–(6), (7) and (8)–(9):

- (4) *Allan Ramsay's paintings are greatly overrated.*
- (5) *He was too concerned with flattering his sitters to paint anything with any depth.*
- (6) *The painting in the Scottish National Gallery is a case in point.*

In (4)–(6) the NPs 'Allan Ramsay', 'he', 'the Scottish National Gallery' are all clearly intended to pick out specific entities. (4) will only do this if S and H are already aware that the common ground is supposed to concern 18th century portrait painters, (5) will work for any speaker and hearer who have just dealt with (4), and (6) will work if S and H have a single (common) painting in their pictures of the world. These are all 'referential' uses of the relevant expressions: $\Delta[S]$ contains one individual called Allan Ramsay, one male individual currently under discussion, and one painting in the Scottish National Gallery. If $\Delta[H]$ is anything like $\Delta[S]$ then it will also contain exactly one item for each description, and the conversation will proceed smoothly (the fact that each person has one such picture in mind does not, of course, guarantee that there *is* exactly one such picture, or that the one that S is thinking of is the one that H is thinking of. This is where misunderstandings come from).

- (7) *The last picture he painted was sold to the sitter's husband.*

If $\Delta[S]$ contains any picture by Allan Ramsay at all, then S can prove that there was a last one that he painted, and likewise for H. This will be true even if S has no handle on which one it was. General knowledge, to the effect that a painter can only finish one picture at a time, will guarantee that if Allan Ramsay painted any pictures then one of them was the last one. This kind of 'attributive' use introduces a place-holder for an item of the specified kind, without necessarily linking it to any other items already in $\Delta[S]$. S may have a complete catalogue of Allan Ramsay's pictures in his head, and may be able to recall them all and produce a perfect reproduction of each, without knowing which was the last to be painted. That doesn't stop him from uttering (7). Furthermore, S may know that H *does* have this information, and may be using the expression deliberately to get H to retrieve the right one, as when S might say 'Can you show me which of these is the last one he painted?'.

The *only* difference between referential and attributive uses of referring expressions on this account concerns the question of whether either person already has an individuated representative of the kind in question in their picture of the common ground. $\Delta[S]$ and $\Delta[H]$ should each support a proof of $\exists X P(X)$, where P is the property underlying the NP (e.g., the property of being named Allan Ramsay, or the property of being the last picture that someone painted). If $\Delta[H]$ supports such

a proof then H should introduce a new internal name, say c_1 , for an individual satisfying the relevant property. These internal names are just Skolem constants, as are all the constants that appear in the formulae which describe an individual's (private and shared) beliefs. If, in addition, $\Delta[H]$ already supports a proof of $P(c_2)$ for some c_2 then the fact that $c_1 = c_2$ should also be recorded. This record will lead directly to rejection of uses of referring expressions in situations where there are two distinct items c_2 and c_3 such that $\Delta[H] \vdash P(c_2)$ and $\Delta[H] \vdash P(c_3)$, since processing them will lead both to $c_1 = c_2$ and to $c_1 = c_3$, which cannot both be true if c_2 and c_3 are distinct.

I noted above that the existential commitments of a referring expression could be captured by saying that what S actually communicates to H is the fact that $\Delta[S] \vdash \exists X male(X)$ holds, with the implication that since $\Delta[S]$ and $\Delta[H]$ should be pretty similar then so should $\Delta[H] \vdash \exists X male(X)$. The Deduction Theorem allows us to restate this in a way which shows how the referential effect described above is encoded. The Deduction Theorem says that $\Delta[S] \vdash \exists X male(X)$ and $\vdash \Delta[S] \rightarrow \exists X male(X)$ are equivalent. The second version brings the common ground out into the open, since we are now considering the ability of S (or H) to reflect on what their view of the common ground implies. It also allows a slightly richer statement of what someone using a referring expression is committed to: if S uses the NP *the man* then

$$\vdash \Delta[S] \rightarrow \exists X (man(X) \wedge \forall Y ((\Delta[S] \rightarrow man(Y)) \rightarrow Y = X))$$

This says that as far as S is concerned, the common ground supports a proof that there is a man, and it doesn't support such a proof for more than one individual. This covers the discussion so far: all we need to consider now is those cases where the common ground doesn't actually support any such proof.

I noted above that (7) could be used in a situation where $\Delta[S]$ supports a proof that there is a last picture painted by Allan Ramsay in order to get H to reveal his extra identifying information about it. It is also clear that S can use referring expressions in situations where he knows that H has *less* information about the item in question, and even when he knows that $\Delta[H]$ will not support even an existence proof. Consider the following pair of sentences:

- (8) *The driver of the bus I came to work on today must have been drunk.*
- (9) *The driver of the bus my monkey went to work on today must have been drunk.*

I could utter (8) in a situation where you knew nothing about how I came to work. In other words, I could produce (8), which invites you to perform a proof concerning how I got to work, in a situation where I knew you could not do so, and nothing would go wrong. The point here is that the claim that I came to work on a bus, and that the bus had a driver, is not too surprising. By uttering (8) I am asking you to

verify this unsurprising fact; but by uttering it when I know you can't do so, I am asking you to do something I know you can't manage.

How can I get away with this? You will be prepared to 'accommodate' my abuse of language at this point if the proposition I am asking you to verify is unsurprising, uninteresting. I have invited you to prove something. You cannot prove it properly from your view of the common ground, but you can see what would have to be in the common ground if you were going to, and you don't mind pretending that it already is. For (9), on the other hand, you would probably decide that I was pushing my luck in supposing that the proposition that I have a monkey that goes to work is unsurprising. If I uttered (9) without preparing the ground you would probably balk; if I uttered (8) you would probably accept it, and update your view of the common ground accordingly.

I have nothing to add to (Sperber and Wilson, 1986)'s account of when something is surprising. I would, however, like to note that this mechanism provides a way of segmenting material into background and foreground information. If I deliberately introduce new material via a referring expression (or other presuppositional device), I must be confident that it is unsurprising. Otherwise you will not accommodate it. But if it's unsurprising it's probably uninteresting: the interesting part of a story is the bit you couldn't anticipate. So by putting new information in a presupposition I am explicitly telling you that it is both new and uninteresting – that it is something you need to know in order to get the point of what I am saying, but that I don't want you to concentrate on it.

To see how all this works out in practice, we return to

(3) *He beats it.*

Under the account given here, this invites the hearer to try to prove that there is a male individual and a neuter one from the contents of his view of the common ground. If (3) follows (2) then the common ground will be as in Figure 1. Under these circumstances it *will* support the relevant proofs, and furthermore the proofs will identify the desired individuals, so that the ensuing model will be as in Figure 2.

This model contains one new entity, namely a beating event, with the man and donkey from the first model as participants. The connection between the individuals introduced by (2) and the referring expressions in (3) is established as described above. We first have to verify that the common ground as it stands after assimilating (2) supports appropriate existence proofs. We then introduce two new constants denoting items of the required kinds, and note that if there are already such items (which in this case there are) then the new ones and the pre-existing ones are in fact identical.

The information in this model would be obtained by any reasonable treatment of referring expressions. If I couldn't show that *he* and *it* referred to the individuals introduced by *a farmer* and *a donkey* then I really would not have achieved very

$type(\#0, [entity, \dots, event, own])$	
$\theta(\#0, object, \#3)$	
$\theta(\#0, agent, \#7)$	
$type(\#3, [entity, \dots, donkey])$	
$type(\#7, [entity, \dots, man])$	$type(\#11, [entity, \dots, event, beat])$
$farmer(\#7)$	$\theta(\#11, object, \#3)$
	$\theta(\#11, agent, \#7)$

Fig. 2. Combined model of (2) and (3).

much. The treatment described above, however, does provide a way of treating more interesting cases. Consider first the classic ‘donkey-sentence’:

- (10) *If a farmer owns a donkey he beats it.*

The paraphrase of this is

$$\begin{aligned}
 &\exists A: \{donkey(A)\} \\
 &\quad \exists B: \{farmer(B)\} \\
 &\quad \exists C: \{aspect(simple, now, C)\} \\
 &\quad \quad \forall D: \{C.D\} \\
 &\quad \quad \quad type(D, [entity, abstract, situation, event, own]) \\
 &\quad \quad \quad \wedge \theta(D, object, A) \wedge \theta(D, agent, B) \\
 \rightarrow &\exists E: \{aspect(simple, now, E)\} \\
 &\quad \forall F: \{E.F\} \\
 &\quad \quad type(F, [entity, abstract, situation, event, beat]) \\
 &\quad \quad \wedge \theta(F, object, ref(\lambda G unsexed(G))) \\
 &\quad \quad \wedge \theta(F, agent, ref(\lambda H male(H)))
 \end{aligned}$$

This provides a conditional rule, of the general form $P \rightarrow Q$.

What do we do with such rules? They do not, by themselves, lead to a change in our picture of the world. If I don’t know of any farmers who own donkeys then (10) will not make me put any new entities into my world model. It has potential for contributing to such changes, but by itself it will not make me update my model.

Such a rule will lie dormant until I realize that I do know of a farmer who owns a donkey. Until, for instance, you tell me that Pedro is a farmer and Roxanne is his donkey. At this point the antecedent of my conditional rule is satisfied, and hence I should also accept the consequent. In other words, I have assimilated the fact that there is a farmer who owns a donkey and I now have to accept the further proposition that he beats it. But this is exactly the situation that arose when I encountered (3) after accepting (2), and my reaction should be exactly the same. In other words,

I do not have to worry about dealing with the pronouns in the consequent until the truth of the antecedent is demonstrated; and when it is so demonstrated, the information that I need for dealing with the referring expressions is available.

A similar argument applies in the case of (11):

(11) *Each man kills the thing he loves.*

$\forall B: \{type(B, [entity, concrete, solid, living, animal, human, man])\}$

$\exists C: \{aspect(simple, now, C)\}$

$\forall A: \{C.A\}$

$type(A, [entity, abstract, situation, event, kill])$

$\wedge \theta(A,$

object,

$ref(\lambda D thing(D)$

$\wedge \exists E: \{aspect(simple, now, E)\}$

$\forall F: \{E.F\}$

$type(F, [entity, abstract, situation,$
event, love])

$\wedge \theta(F, object, D)$

$\wedge \theta(F, agent, ref(\lambda G male(G))))$

$\wedge \theta(A, agent, B)$

What we have here is again a rule which has the potential to produce new concrete statements, but which has no immediate direct effect on our model of the world. If I hear (11) in a situation where I am aware of a specific man, or if I become aware of one after hearing it, then I should be prepared to update my model of the world using the relevant instantiation of this general principle. But of course under those circumstances I *will* be able to perform the necessary proof to support replacing $\lambda G male(G)$ by a pointer to a particular man, and then to accommodate the proof required for the surrounding reference term relating the existence of an entity which this man loves.

To see the construction of a model in the kind of situation where a referring expression is used ‘attributively’, consider (12).

(12) *A man and a woman ran a race. The winner was given a prize.*

The model that emerges for (12) is shown in Figure 3.

The point about this example is that when you hear about a race you know that under normal circumstances it will have a winner, though this entity is not explicitly mentioned and you won’t in general know who it is. So after the first sentence we should know that there are a man and a woman, and a race, and a winner of that race, though we will not know whether the winner is the man or the woman. When we encounter the second sentence, we need to be able to prove that the common ground supports the existence of a winner, which of course it does. The fact that we cannot equate that winner with the man or the woman is neither here nor there.

<i>type</i> (#1, [<i>entity</i> , . . . , <i>run</i>])	<i>type</i> (#15, [<i>entity</i> , . . . , <i>give</i>])
<i>θ</i> (#1, <i>object</i> , #2)	<i>θ</i> (#15, <i>to</i> , #9)
<i>θ</i> (#1, <i>agent</i> , #7)	<i>θ</i> (#15, <i>object</i> , #16)
<i>θ</i> (#1, <i>agent</i> , #8)	
	<i>prize</i> (#16)
<i>race</i> (#2)	
<i>winner</i> (#2, #9)	
<i>type</i> (#7, [<i>entity</i> , . . . , <i>woman</i>])	
<i>type</i> (#8, [<i>entity</i> , . . . , <i>man</i>])	
<i>winner</i> (#9)	

Fig. 3. Combined model of (12).

2.2. Underspecification

It sometimes happens that the sentence a speaker produces admits more than one interpretation. It may be that it contains words which are individually ambiguous, it may be that there is more than one potential syntactic analysis, or it may just be that the words and their syntactic underdetermine the meaning.

In nearly all (all???) such cases of ‘underspecification’ the speaker has some specific piece of ‘private’ knowledge to convey, but the hearer can’t tell what that information is. The techniques described in Section 2.1 can be used to help here as well. The point here is that the message the speaker intended to convey ought at least to be coherent. We can therefore test the possible interpretations by using our theorem prover to evaluate the possible models of each. Any that have no models can be ruled out, and with any luck that will leave us with a single interpretation.

I will start by considering various sentences containing the word ‘*fire*’, which has two readings – you can fire a gun, by causing an explosion which forces a projectile down a barrel, or you can fire an employee, by terminating their contract. There may be some historical link between these two senses of ‘*fire*’, but it is now lost. For any practical purposes, if you hear a sentence containing this word you will interpret it in one of these ways.

Consider

(13) *A man fired a gun.*

This has two readings, depending on which form of ‘*fire*’ is intended. Chart parsing techniques make it possible to ‘pack’ the corresponding syntactic analyses, which means that if we have a compositional semantics we should be able to pack the two readings in exactly the same way. The resulting paraphrase therefore looks like:

$$\begin{aligned}
&\exists C: \{C < \text{now}\} \\
&\quad \exists D: \{\text{aspect}(\text{perfective}, C, D)\} \\
&\quad \quad \forall E: \{D.E\} \\
&\quad \quad \quad \exists F: \{\text{gun}(F)\} \\
&\quad \quad \quad \quad \exists A: \{\text{type}(A, ([\text{entity}, \dots, \text{man}]))\} \\
&\quad \quad \quad \quad \quad \text{type}(E, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{fire2}]) \\
&\quad \quad \quad \quad \quad \wedge \theta(E, \text{object}, F) \wedge \theta(E, \text{agent}, A) \\
&\quad \quad \quad \quad \otimes \exists G: \{\text{gun}(G)\} \\
&\quad \quad \quad \quad \quad \exists B: \{\text{type}(B, ([\text{entity}, \dots, \text{man}]))\} \\
&\quad \quad \quad \quad \quad \quad \text{type}(E, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{fire1}]) \\
&\quad \quad \quad \quad \quad \quad \wedge \theta(E, \text{object}, G) \wedge \theta(E, \text{agent}, B)
\end{aligned}$$

The \otimes here marks the point at which the two interpretations diverge.

We have not yet achieved a great deal. Since the ambiguity arises at the semantic heads of the two readings, very little is actually shared beyond the tense/aspect information, and there is a great deal of repetition within the unshared components.

Before the theorem prover can do anything with any of the formal paraphrases we have seen so far, they have to be converted to an appropriate normal form. This is completely standard practice: theorem provers nearly always want various surface variations removed before they can start work. The normal form that Manthey and Bry's theorem prover requires is quantifier-free sequent form. This is a form in which universal quantifiers have been removed, existential quantifiers have been replaced by Skolem constants and functions, and various operations that alter the relative positions of negation, conjunction and disjunction have been performed. The result of these manipulations is a form which can easily be manipulated in order to extract the common elements of two divergent interpretations, so that what the theorem prover actually works on is

$$\begin{aligned}
&\#79 < \text{now} \\
&\wedge \text{aspect}(\text{perfective}, \#79, \#80) \\
&\wedge \#80.A \\
&\quad \rightarrow \text{gun}(\#81) \\
&\quad \quad \wedge \text{type}(\#82, [\text{entity}, \dots, \text{man}]) \\
&\quad \quad \wedge \theta(A, \text{object}, \#81) \\
&\quad \quad \wedge \theta(A, \text{agent}, \#82) \\
&\quad \quad \wedge \pi[S] \rightarrow \text{type}(A, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{fire2}]) \\
&\quad \quad \vee \pi[S] \rightarrow \text{type}(A, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{fire1}])
\end{aligned}$$

The crucial part of this analysis says that $\pi[S]$ (S's private belief set) includes either the fact that this was an event of type *fire1* (propelling a bullet) or the fact that it was an event of type *fire2* (sacking an employee). If S's private view of the world includes the claim that the event is of type *fire2* then it must be possible to construct a model of the world in which this claim *and everything it entails* is true. If we take the formal paraphrases of 'A man fired a gun' and 'A man fired a

A man fired a secretary	A man fired a gun
$type(\#3, [entity, \dots, fire2])$ $\theta(\#3, object, \#17)$ $\theta(\#3, agent, \#4)$	$type(\#2, [entity, \dots, fire1])$ $\theta(\#2, object, \#3)$ $\theta(\#2, agent, \#4)$
$type(\#4, [entity, \dots, man])$	$type(\#4, [entity, \dots, man])$
$type(\#17, [entity, \dots, human])$ $secretary(\#17)$	$type(\#3, [entity, \dots, nonliving])$ $firearm(\#3)$ $gun(\#3)$
$type(\#2, [entity, \dots, employ])$ $\theta(\#2, object, \#17)$	

Fig. 4. Alternative readings of 'fire'.

secretary' (which looks just like the above, apart from the obvious substitution of *secretary* for *gun*), we get the models shown in Figure 4.

For '*a man fired a secretary*' the model that is obtained by interpreting '*fire*' as *fire1* is rejected, on the grounds that the object of an event of this kind must be a firearm, which secretaries clearly cannot be.² The meaning postulates for the other sense then show that #17 must in fact be an employee of #4 (there must be an event of type *employ* involving them: note that this event actually shows up in the model, with the secretary as its object).

This view of underspecification resembles (Wedekind, 1996), treating underspecification by reasoning about which of the things the speaker *might* have meant actually makes sense. Note that, as with (Reyle, 1993), even if you can't choose between them, you can still reason perfectly well about the parts which are not underspecified. Consider a case of attachment ambiguity, e.g.,

(14) *I saw a man in the park.*

The contributions of the packed phrases '*saw a*' (*man (in the park)*) and ('*saw a man*') (*in the park*) are marked in the interpretation by \otimes :

$$\begin{aligned}
 \exists C: \{C < now\} \\
 \exists D: \{aspect(simple, C, D)\} \\
 \forall E: \{D.E\} \\
 \exists A: \{type(A, \\
 ([entity, concrete, solid, living, animal, human, \\
 man]))\}
 \end{aligned}$$

² This is captured by the fact that secretaries and firearms have incompatible types.

$$\begin{aligned}
& \text{type}(E, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{see}]) \\
& \wedge \theta(E, \text{object}, A) \\
& \wedge \theta(E, \text{agent}, \text{ref}(\lambda F \text{speaker}(F))) \\
& \wedge \text{in}(E, \text{ref}(\lambda G \text{park}(G))) \\
& \otimes \exists B: \{ \text{type}(B, \\
& \quad ([\text{entity}, \text{concrete}, \text{solid}, \text{living}, \text{animal}, \\
& \quad \text{human}, \text{man}])) \\
& \wedge \text{in}(B, \text{ref}(\lambda H \text{park}(H))) \} \\
& \text{type}(E, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{see}]) \\
& \wedge \theta(E, \text{object}, B) \\
& \wedge \theta(E, \text{agent}, \text{ref}(\lambda I \text{speaker}(I)))
\end{aligned}$$

Looking for the common parts in the normal form produces the following analysis:

$$\begin{aligned}
& \#57 < \text{now} \\
& \wedge \text{aspect}(\text{simple}, \#57, \#58) \\
& \wedge \#58.A \\
& \rightarrow \text{type}(\text{skolem}(\#59, [A]), [\text{entity}, \text{concrete}, \text{solid}, \text{living}, \text{animal}, \\
& \quad \text{human}, \text{man}]) \\
& \wedge \text{type}(A, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{see}]) \\
& \wedge \theta(A, \text{object}, \text{skolem}(\#59, [A])) \\
& \wedge \theta(A, \text{agent}, \text{ref}(\lambda B \text{speaker}(B))) \\
& \wedge \text{private}([s]) \rightarrow \text{in}(A, \text{ref}(\lambda C \text{park}(C))) \\
& \quad \vee \text{private}([s]) \rightarrow \text{in}(\text{skolem}(\#60, [A]), \text{ref}(\lambda D \text{park}(D)))
\end{aligned}$$

The two interpretations share a considerable amount of information. The problem for the hearer is that it is not clear whether it is the event set A or the man $\text{skolem}(\#59, [A])$ which was located in the park (the NP ‘a man’ produces a Skolem function $\text{skolem}(\#59, [A])$ rather than just a Skolem constant because I am treating aspect as a relationship between an instant and a set of events, so that the existence of this man is introduced when we are talking about *every* member of this event set. This treatment of aspect is discussed at greater length in Section 3.3). The packed interpretation therefore includes the fact the speaker presumably has one of these readings in mind, but that the surface form does not make it clear which. Both interpretations are feasible, given reasonable characterizations of what men and parks are like, so the model building process will not enable the hearer to choose between them. *Nor will any other mechanism* – statistical methods, heuristics which decide that shallow attachments are preferable to deep ones, and so on cannot reliably settle a case like (14). The best we can do is to work with the shared components, and either make a more or less random choice between the alternatives or carry them forward unresolved. Either way, we do at least have something useful to work with, namely the common part.

3. Interpreting (sub)lexical items in context

The analyses in Section 2 show how you can deal with the dynamic aspects of language if you allow utterances to include statements about the shared and private beliefs of the speaker and hearer and if you further think about the reasoning that the discourse participants will perform when considering an utterance. It turns out that the same notions will support very delicate and parsimonious accounts of lexical semantics.

- as argued above, the key step in comprehension involves building a model of the world which admits the information encoded in the utterance. The inference steps involved in this process can be deployed to extract detailed information from sets of ‘meaning postulates’ which provide further information about the concepts encoded by lexical items.
- considerable flexibility can be achieved by considering multiple ‘views’ of a given entity.

The discussion below will concentrate on lexical items with particularly ‘light’ semantics, i.e., things like tense and aspect markers and prepositions which appear to mean different things when used in (linguistically) different contexts. Such items are notoriously difficult to characterize. They are not exactly ‘ambiguous’ – you wouldn’t want to say that the present participle markers in

(15) *He is sleeping.*

(16) *He is hiccuping.*

are different items; but they do produce different effects – (15) denotes a single unfinished sleeping event, (16) denotes an unfinished *sequence* of hiccups. I have argued elsewhere (Ramsay, 1992, 1996) that the two effects can be seen as the result of combining a very sparse description of the ‘meaning’ of the marker ‘-ing’ with appropriate descriptions of the temporal properties of ‘*sleep*’ and ‘*eat*’. The current paper extends this notion to cover other items with the same general properties.

3.1. *Meaning postulates*

Consider the sentence

(17) *A dead dog ordered a drink.*

A formal paraphrase of this might look like

$$\begin{aligned} \exists A: \{ & \text{dead}(A, \lambda B \text{dog}(B)) \} \\ \exists C: \{ & C < \text{now} \} \\ \exists D: \{ & \text{aspect}(\text{perfective}, C, D) \} \end{aligned}$$

$$\begin{aligned}
&\forall E: \{D.E\} \\
&\quad type(E, [entity, abstract, situation, event, order]) \\
&\quad \wedge \theta(E, object, \lambda F \exists G : \{drink(G)\} F.G) \\
&\quad \wedge \theta(E, agent, A)
\end{aligned}$$

This paraphrase has a number of desirable properties. It encodes the temporal properties of the reported event set; it marks the relationships between this event set and its participants; it treats the adjective as a relationship between an individual and a class (thus leaving space for non-intersective treatments of adjectives); and it makes the object of the event some abstraction over situations in which a drink is present, thus avoiding any commitment to the existence of a particular drink.

But what it doesn't do is tell you what (17) actually *means*. Or at least, it doesn't tell you how someone who uttered (17) might see the world. It doesn't, for instance, tell you that there is something very odd about the speaker's view of the world, which there must be since dead dogs don't go around performing volitional acts.

Faced with a sentence like (17), any attempt to give a formal account of its significance must involve constructing a formal paraphrase like the one given above. The problem is that unless you back such paraphrases up with some indication of how the various terms are linked to other concepts and with an engine for drawing out the consequences of these links then what you can say about the speaker's view of the world will be very sketchy. The approach I want to take involves acknowledging that I have a responsibility to specify the connections between words and concepts to the best of my ability; and using these during the model construction process described in Section 2.1.

As far as specifying the connections between words and concepts is concerned, you just have to do it. You may be able to extract some of what you want automatically from corpora or other lexical resources, though most attempts to do so only extract rather superficial semantic features. Wherever you get them from, however, you need to write them down in some appropriate form. A reasonably interesting one, relating to the example above, is

$$\begin{aligned}
&\forall A: \{type(A, [entity, abstract, situation, event, order])\} \\
&\quad \forall B: \{\theta(A, agent, B)\} \\
&\quad \exists C: \{\theta(A, object, C)\} \\
&\quad \quad want(B, [C.\lambda D have(B, D)])
\end{aligned}$$

This says that if *B* is the agent of some ordering event where *C* describes what was ordered, then *B* wanted a situation in which he or she had something of the specified kind. Suppose we consider a more reasonable sentence, say,

(18) *A man ordered a drink.*

with the following paraphrase:

$type(\#1, [entity, abstract, situation, event, order])$
 $\theta(\#1, object, \lambda J \exists K : \{\lambda L drink(L)\} J.K)$
 $\theta(\#1, agent, \#5)$

 $type(\#5, [entity, concrete, solid, living, animal, human, man])$
 $intended(\#5, \#1)$
 $male(\#5)$
 $want(\#5, [\exists M :: \{drink(M)\} have(\#5, M)])$

Fig. 5. Model for 'A man ordered a drink'.

$\exists A: \{type(A, [entity, concrete, solid, living, animal, human, man])\}$
 $\exists B: \{B < now\}$
 $\exists C: \{aspect(perfective, B, C)\}$
 $\forall D: \{C.D\}$
 $type(D, [entity, abstract, situation, event, order])$
 $\wedge \theta(D, object, \lambda E \exists F : \{drink(F)\} E.F)$
 $\wedge \theta(D, agent, A)$

The model construction process produces the model in Figure 5 for (18). Note that this model contains the fact that what #5 wants is for the proposition $\exists M : \{drink(M)\}have(\#5, M)$ to be true. This emerges from combining the intensional reading of 'a drink' as $\lambda E \exists F : \{drink(F)\}E.F$ with the meaning postulate for order.

This technique of backing up your formal paraphrases with appropriate 'meaning postulates',³ and using these in order to construct concrete models of what has been said, is particularly fruitful for terms with 'light' semantics – things like prepositions and tense/aspect markers which seem to pick up a great deal of their significance from the linguistic context.

3.2. Prepositions and multiple-views

Consider the following three sentences:

- (19) *A man reads a book in a park.*
 (20) *A man reads a story in a book.*
 (21) *A man reads a story in a park.*

³ See (Cruse, 1986) for a discussion of the relationship between meaning postulates and sets of necessary and sufficient conditions.

Each of these has an interpretation under which the prepositional phrase modifies the VP rather than the final NN (so that (19)–(21) are closely related to the questions ‘Where did a man read a book/story?’).

Under these interpretations, it seems reasonable to say that (19) supports the inference that the book was also in the park, and that (20) supports the inference that the story was in the book, but that no corresponding conclusion follows from (21). Intuitively we feel that the object of a reading event will generally be in the same place as the event itself; but that stories and parks are of such different types that it doesn’t make much sense to talk of a story being in a park (that is not to say that a story can’t be *set* in a park; but that’s a different question).

To cope with this, I introduce the idea that it is possible to have multiple views of the same entity. So a reading event can be seen as a physical entity, involving some physical object with marks on it; as a mental entity, involving some abstract object with a ‘propositional content’; as a temporal entity, entering into relationships with other temporal entities; and maybe in other ways too. Thus the interpretation of a simple sentence such as

(22) *A man reads a book.*

leads to the construction of the model in Figure 6.

The key item in this model is the event #0. The first entry in the model says that #0 is an event of a particular kind. The next three statements introduce different views of this event. #5, for instance, is the temporal view of the event: as such, it is capable of entering into relationships with other temporal entities, so that the model contains an instant #7 which is the start point of #5 and which precedes the reference instant *now*, and likewise for the other temporal entities in the model. #13, on the other hand, is the view of the event as a physical entity, and #12 is its view as an abstract mental activity.

These different items can each enter into appropriate relationships. In particular, we can capture the fact that the object of a reading event can generally be found at the location where the event took place with a rule like the following:

$$\begin{aligned} \forall A \forall B \forall C \forall D \forall E. & \text{sharedobjloc}(A) \wedge \text{view}(A, D) \\ & \wedge \text{location}(D, C) \wedge \theta(A, \text{object}, B) \\ & \wedge \text{view}(B, E) \wedge E \approx C \rightarrow \text{location}(E, C) \end{aligned}$$

$E \approx C$ here means that E and C should have compatible types in the sense noted above. So this rule says that if C is the location, from some point of view, of an event A that shares its location with its object, and E is a view of A ’s object, then C will also be E ’s location if they have compatible types.

We also need to characterize the meaning of ‘*in*’. The following rule says that if A is in B then if A and B have views with compatible types, say C and D , and B has an envelope E then C can be found by finding E :

```

type(#0, [entity, abstract, situation, event, read])
θ(#0, object, #3)
θ(#0, agent, #10)
view(#0, #5)
view(#0, #12)
view(#0, #13)

type(#12, [entity, abstract, mental])
type(#13, [entity, concrete])

type(#5, [entity, abstract, temporal, interval])
type(#3, [entity, abstract, mental])
book(#3)
view(#3, #11)

type(#11, [entity, concrete, solid])
type(#7, [entity, abstract, temporal, instant])
#7 < now
start(#7, #5)

type(#10, [entity, concrete, solid, living, animal, human, man])
male(#10)

```

Fig. 6. Model for 'A man reads a book'.

$$\begin{aligned}
 \forall A \forall B : \{in(A, B)\} \\
 \forall C :: \{view(A, C)\} \\
 \forall D :: \{view(B, D)\} \\
 \forall E :: \{envelope(B, E)\} \\
 E \approx C \rightarrow location(C, E)
 \end{aligned}$$

This rule just seems to replace one undefined term, *in*, by another, *envelope*. We seem to be no further forward. Note, however, that the envelope is associated with a particular view of the ground *B*. This enables us to see what '*in*' means when it is used with any kind of entity that can be seen as having an envelope – physical spaces, which have simple physical envelopes, temporal entities such as intervals whose envelopes are something like open subsets of the real line, sets of entities which are presumably their own envelopes, and so on.

This rather object-oriented approach makes it possible to give a word like '*in*' a very flexible interpretation, without making it ambiguous and without appealing

to metaphorical relations. The word '*in*' picks out the envelope of the ground as the place where you will find the figure. If the figure and the ground have views with compatible types and you know what the envelope of the relevant view of the ground is like, you know what follows from saying that the figure is in the ground.

Of course the notion of envelope itself may have historical or developmental roots in the spatial notion, as suggested by, e.g., (Jackendoff, 1983). Nonetheless, it is not self-evident that the spatial notion is particularly central to everyday use of the word '*in*'. In, for instance, a collection of 492 sentences from the 8000 or so sentences containing this word from the British National Corpus, just 91 involved items that could be seen as physical locations. The others included many phrasal verbs and special cases such as '*in particular*', but even ignoring these the proportion of cases where '*in*' introduces a physical relation between an object and physical space is not all that impressive ('*in*' a period of time, or '*in*' a collection, have comparable numbers of occurrences).

The rules given above will produce the models in Figure 7 for (19) and (20). What matters here is that the model of '*A man reads a story in a book*' locates the man #4 and the physical view #15 of the book in the physical envelope #7 of the park, whereas the model of '*A man reads a story in a book*' locates the story, which is a mental object, in the envelope #6 of the mental view of the book and quite rightly says nothing about the location of the man. Various different kinds of entity will have their own envelopes. If you see the word '*in*', you just have to decide what kind of envelope(s) the ground has and which of them are compatible with some view of the figure.

As a final illustration, consider (23), which exemplifies the second commonest use of '*in*' in the extract of the BNC which I inspected:

(23) *A man reads a book in January.*

Figure 8 shows the model obtained for this sentence. The relevant view of the event is the temporal one #7, which is located with respect to the envelope #5 of the month called January. The fact that the envelope of some temporal entity is the location of the temporal view of the event will have the consequence that the start and end points of the event are included in January. This arises from the properties of temporal envelopes: it is at this point that the advantages of the 'object-oriented' character of such notions pay off.

We can treat other items with light semantics in much the same way. Consider, for instance, the prepositions '*from*' and '*to*'. Dowty (Dowty, 1991, p. 569) suggests that you can deal with (24) by viewing a driving event as a path, and then equating the locations of London and Paris with the start and end points of that path, by requiring the prepositions to pick out these two points. If we separate out (i) the view of the event as a path, (ii) the fact that paths have start and end points, and (iii) the function of '*from*' and '*to*' as picking out start and end points, then we can get a quite general analysis which deals with (24) exactly as suggested by

A man reads a book in a park	A man reads a story in a book
<i>type</i> (#0, [entity, ..., read]) <i>in</i> (#0, #17) <i>θ</i> (#0, object, #3) <i>θ</i> (#0, agent, #4) <i>view</i> (#0, #19)	<i>type</i> (#0, [entity, ..., read]) <i>in</i> (#0, #14) <i>θ</i> (#0, object, #3) <i>θ</i> (#0, agent, #4) <i>view</i> (#0, #17)
<i>type</i> (#19, [entity, concrete]) <i>location</i> (#19, #7)	<i>type</i> (#17, [entity, abstract, mental]) <i>location</i> (#17, #6)
<i>type</i> (#3, [entity, abstract, mental]) <i>book</i> (#3) <i>view</i> (#3, #15)	<i>type</i> (#3, [entity, abstract, mental]) <i>location</i> (#3, #6) <i>story</i> (#3)
<i>type</i> (#15, [entity, concrete, solid]) <i>location</i> (#15, #7)	<i>type</i> (#4, [entity, ..., man])
<i>type</i> (#4, [entity, ..., man]) <i>location</i> (#4, #7)	<i>type</i> (#14, [entity, abstract, mental]) <i>book</i> (#14) <i>envelope</i> (#14, #6)
<i>type</i> (#17, [entity, concrete, solid]) <i>envelope</i> (#17, #7) <i>park</i> (#17)	
<i>type</i> (#7, [entity, concrete, solid])	

Fig. 7. Models for (19) and (20).

Dowty, but which also deals with (25) by drawing on the fact that the temporal view of an event also has a start and end point.

(24) *John drove from London to Paris.*

(25) *John drove from dawn to dusk.*

The formal paraphrase of (24) is as follows, with the paraphrase of (25) too similar to be worth repeating.

$\exists A: \{A < \text{now}\}$
 $\exists B: \{\text{aspect}(\text{simple}, A, B)\}$
 $\forall C: \{B.C\}$
 $\text{type}(C, [\text{entity}, \text{abstract}, \text{situation}, \text{event}, \text{drive}])$

```

type(#0, [entity, abstract, situation, event, read])
in(#0, #15)
θ(#0, object, #3)
θ(#0, agent, #4)
view(#0, #7)

type(#7, [entity, abstract, temporal, interval])
location(#7, #5)

type(#3, [entity, abstract, mental])
book(#3)

type(#4, [entity, concrete, solid, living, animal, human, man])

type(#15, [entity, abstract, temporal, interval])
envelope(#15, #5)
month(#15)
named(#15, January)

type(#5, [entity, abstract, temporal, interval])

```

Fig. 8. 'A man reads a book in January'.

$$\begin{aligned}
&\wedge \theta(C, \text{agent}, \text{ref}(\lambda D \text{named}(D, \text{John}))) \\
&\wedge \text{from}(C, \text{ref}(\lambda E \text{named}(E, \text{London}))) \\
&\wedge \text{to}(C, \text{ref}(\lambda F \text{named}(F, \text{Paris})))
\end{aligned}$$

This paraphrase of (24), and the corresponding one for (25), produce the models in Figure 9.

These models arise from the interactions between the paraphrases of (24) and (25) and the following rule about 'from' (and a similar one for 'to'):

$$\begin{aligned}
\forall A \forall B: &\{\text{from}(A, B)\} \\
\forall C: &\{\text{view}(A, C)\} \\
&\forall D :: \{\text{view}(B, D)\} \\
&\forall E :: \{\text{start}(E, C)\} C \approx D \rightarrow E = D
\end{aligned}$$

This rule says that if the relationship 'from' holds between the figure A and the ground B then if C and D are views of A and B , E is the start of C , and C and D have compatible types, then B and E are the same. In the model for (25) this 'place' is in fact an instant, but that's OK.

John drove from London to Paris	John drove from dawn to dusk
<i>type</i> (#0, [entity, ..., drive]) <i>θ</i> (#0, agent, #18) <i>from</i> (#0, #1) <i>to</i> (#0, #2) <i>view</i> (#0, #15)	<i>type</i> (#0, [entity, ..., drive]) <i>θ</i> (#0, agent, #10) <i>from</i> (#0, #1) <i>to</i> (#0, #2) <i>view</i> (#0, #7)
<i>type</i> (#1, [entity, concrete, place]) <i>named</i> (#1, London) <i>start</i> (#1, #15)	<i>type</i> (#1, [entity, ..., instant]) <i>dawn</i> (#1) <i>start</i> (#1, #7)
<i>type</i> (#2, [entity, concrete, place]) <i>end</i> (#2, #15) <i>named</i> (#2, Paris)	<i>type</i> (#2, [entity, ..., instant]) <i>dusk</i> (#2) <i>end</i> (#2, #7)
<i>type</i> (#15, [entity, concrete]) <i>path</i> (#15)	<i>type</i> (#7, [entity, ..., interval])
<i>type</i> (#18, [entity, ..., man]) <i>named</i> (#18, John)	<i>type</i> (#10, [entity, ..., man]) <i>named</i> (#10, John)

Fig. 9. Models for (24) and (25).

The final example is also drawn from (Dowty, 1991), where it is suggested that (26) ‘asserts that the information in the file, viewed abstractly, ‘moves’ from one place to another’ (p. 597).

(26) *It copies a file to a disk.*

The model in Figure 10 says that #21, which is something which resembles #3, the file (which is viewed as a piece of information), is located at #17, which is the view of the disk as a piece of information.

This comes about as a result of combining the formal paraphrase of (26) with the following fact about copying events:

$$\begin{aligned}
 \forall A: \{ & type(A, [entity, abstract, situation, event, copy]) \} \\
 \forall B: \{ & to(A, B) \} \\
 \forall C: \{ & view(B, C) \} \\
 \forall D: \{ & \theta(A, object, D) \} \\
 \forall E: \{ & view(D, E) \wedge C \approx F \} \\
 & \exists G similar(G, E) \wedge location(C, G)
 \end{aligned}$$

```

type(#2, [entity, abstract, situation, event, copy])
θ(#2, object, #3)
θ(#2, agent, #4)
to(#2, #20)
view(#2, #16)

type(#3, [entity, abstract, information])
file(#3)

type(#4, [entity, concrete, solid])

type(#17, [entity, abstract, information])
location(#17, #21)

disk(#20)
view(#20, #17)

similar(#21, #3)

```

Fig. 10. Model for (26).

This says that if there is a copying event *A* whose destination is *B*, then if *C* and *E* are compatible views of *B* and the object of *D* of this event then something ‘similar’ to *E* can be found at *C*. The predicate *similar* is yet another weak term which picks up a great deal of its significance from the properties of its arguments. To say that two pieces of information are similar to one another is quite different from saying that two pictures are, or two people are, or ...

3.3. Tense and aspect

Tense markers seem to provide information which will locate the reported event with respect to some point in time – often the time at which the utterance is produced but sometimes some other salient instant. Aspect markers say something about the relation between this instant and the start and end points of the event. The consequences of choosing a given aspect marker, however, seem to vary in rather subtle ways, depending on the nature of the reported event. Consider, for instance, (27)–(29):

- (27) *Henrietta is crossing the road.*
- (28) *Harry is hiccuping.*
- (29) *Herman is living in Stuttgart.*

These are all present tense sentences, so the relevant time point is the utterance time. They are all also progressives. The contribution made by the progressive marker, however, seems to be quite different in the three cases: in (27) we have a single road-crossing event which has started but is not yet complete,⁴ in (28) we have an ongoing series of hiccups, and in (29) we have a temporary state of affairs. How can the progressive marker carry all these different consequences? What produces them if the progressive marker doesn't?

The short answer is that it is the interaction between the properties of the reported event and the progressive marker that produces these effects. Moëns and Steedman (1988) show that this can be achieved by, roughly speaking, drawing up a table of event types and allowing aspect markers to choose their interpretations by looking at the type of the given event. This is tantamount to accepting that aspect markers are *ambiguous*, with easily invoked mechanisms for choosing between interpretations.

The mechanisms outlined above suggest a different approach. Instead of saying that aspect is ambiguous or underspecified, in that there are a number of different senses which we have to select between, I propose to give the aspect markers very weak meaning postulates. These will combine with the meaning postulates that capture the temporal properties of the event in question so that the different consequences of (27)–(29) *emerge* from the model construction process, rather than being precoded and then selected for.

The crucial difference between (27) and (28) seems to be that (27) refers to a single event whereas (28) refers to a *set* of events. This parallels the relation between singular and plural NPs, where a singular NP seems to depict an individual and a plural NP depicts a set of individuals. Close consideration of NPs suggests that it might be better to say that all NPs denote sets, but that the set denoted by a singular NP will contain exactly one item and the set denoted by a plural will contain more than one. This makes it possible to give a uniform treatment of the relations between a verb and its arguments: if we decided that singular NPs denoted things and plurals denoted sets of things then everything we said about verbs and their arguments would have to contain caveats about whether the argument was an individual or a set. Treating them uniformly is much simpler.

The same idea can be invoked to cover the difference between (27) and (28). I assume that sentences report *sets* of events, where the aspect marker specifies a relationship between the whole set and the specified instant. I will then take it that the progressive aspect says that there is at least one member of the specified set that started before the given instant, and at least one that didn't end before it:

$$\begin{aligned} &\forall A \forall B \text{Aspect}(\text{prog}, B, A) \\ &\quad \rightarrow \exists C: \{A.C\} \\ &\quad \quad \forall D: \{\text{view}(C, D) \end{aligned}$$

⁴ and may never be: see (Asher, 1992) for a discussion of the difference between '*Henrietta was crossing the road when I saw her*' and '*Henrietta was crossing the road when the bus hit her*'.

$$\begin{aligned}
& \wedge \text{type}(D, [\text{entity}, \text{abstract}, \text{temporal}, \text{interval}])\} \\
& \forall E: \{\text{start}(E, D)\} E < B \\
& \wedge \exists F: \{A.F\} \\
& \forall G: \{\text{view}(F, G) \\
& \quad \wedge \text{type}(G, [\text{entity}, \text{abstract}, \text{temporal}, \text{interval}])\} \\
& \forall H: \{\text{end}(H, G)\} B < H
\end{aligned}$$

In detail this says that if A is a set of events which is in the progressive aspect with respect to the instant B then A has at least one member C which, when viewed as an interval D , started before B ; and at least one member F which, when viewed as an interval G , ended after B (if, indeed, it ended at all). There is nothing in this MP to say how large the set A is, and in particular there is nothing to say that C and F must be distinct.

We also need to characterize what we know about the temporal properties of the events that are members of A . For different verbs, the temporal characteristics of the reported event will change. We might, for instance, note that the start and end points of an road crossing event are separated by a perceptible amount of time, whereas hiccuping is conceptually instantaneous. The following MPs describe what extended and instantaneous events are like:

$$\begin{aligned}
& \forall A \text{extended}(A) \wedge \text{view}(A, B) \\
& \quad \wedge \text{type}(B, [\text{entity}, \text{abstract}, \text{temporal}, \text{interval}]) \\
& \quad \rightarrow \forall C \text{start}(C, A) \rightarrow (\forall D \text{end}(D, A) \rightarrow \exists E (C < E \wedge E < D)) \\
& \forall A \forall B \text{instantaneous}(A) \wedge \text{view}(A, B) \\
& \quad \wedge \text{type}(B, [\text{entity}, \text{abstract}, \text{temporal}, \text{interval}]) \\
& \quad \rightarrow \forall C \text{start}(C, B) \rightarrow (\forall D \text{end}(D, B) \rightarrow C = D)
\end{aligned}$$

The interactions of these quite innocuous looking descriptions of extended and instantaneous events with the description of the progressive aspect are quite dramatic. In particular, with a set of extended events it is quite possible for a single member of the set to play the roles of both C and F in the characterization of the progressive; with a set of instantaneous events this can't happen, since the description of the progressive says that the reference time B must be between the start point of C and the end point of F , which would contradict the fact that the start and end points of an instantaneous event are the same. As a consequence the models in Figure 11 emerge from (27) and (28).

The models in Figure 11 contain far more detail about the temporal properties of the reported events than was present in any of the previous examples. This is simply because I edited out this detail for the sake of clarity. All the models produced so far have the same kind of temporal entities in them.

Consider first the model for (27). The first item in this is a singleton set #20 which is in the perfective aspect with respect to now. This is a set of events. Its

Henrietta is crossing the road	Harry is hiccuping
<i>singleton</i> (#20) <i>aspect</i> (<i>prog</i> , <i>now</i> , #20) #20.#21 <i>type</i> (#21, [<i>entity</i> , ..., <i>cross</i>]) <i>extended</i> (#21) θ (#21, <i>object</i> , #3) θ (#21, <i>agent</i> , #15) <i>view</i> (#21, #22) <i>type</i> (#22, [<i>entity</i> , ..., <i>interval</i>]) <i>type</i> (#24, [<i>entity</i> , ..., <i>instant</i>]) <i>start</i> (#24, #22) #24 < <i>now</i> <i>type</i> (#26, [<i>entity</i> , ..., <i>instant</i>]) <i>end</i> (#26, #22) <i>now</i> < #26 <i>type</i> (#15, [<i>entity</i> , ..., <i>woman</i>]) <i>named</i> (#15, <i>Henrietta</i>) <i>road</i> (#3)	<i>severalton</i> (#2) <i>aspect</i> (<i>prog</i> , <i>now</i> , #2) #2.#3 #2.#4 <i>type</i> (#3, [<i>entity</i> , ..., <i>hiccup</i>]) <i>atelic</i> (#3) <i>instantaneous</i> (#3) θ (#3, <i>agent</i> , #11) <i>view</i> (#3, #6) <i>type</i> (#6, [<i>entity</i> , ..., <i>interval</i>]) <i>type</i> (#0, [<i>entity</i> , ..., <i>instant</i>]) <i>end</i> (#0, #6) <i>start</i> (#0, #6) <i>now</i> < #0 <i>type</i> (#4, [<i>entity</i> , ..., <i>hiccup</i>]) <i>atelic</i> (#4) <i>instantaneous</i> (#4) θ (#4, <i>agent</i> , #11) <i>view</i> (#4, #7) <i>type</i> (#7, [<i>entity</i> , ..., <i>interval</i>]) <i>type</i> (#1, [<i>entity</i> , ..., <i>instant</i>]) <i>end</i> (#1, #6) <i>start</i> (#1, #7) #1 < <i>now</i> <i>type</i> (#11, [<i>entity</i> , ..., <i>man</i>]) <i>named</i> (#11, <i>Harry</i>)

Fig. 11. Models for (27) and (28).

sole member, #21, is a road crossing event involving Henrietta. This is an extended event, which means that there should be some instant between its start and end points.

#21 has a temporal view, #22, which is in fact an interval: the interval during which the event took place. #24 and #26 are the start and end points of this interval, and they are separated by *now* (since *now* is after #24 and before #26). This fits nicely with the fact that #21 is extended.

The first item in the model for (28), on the other hand, is a severalton set #2 which is in the progressive aspect with respect to *now*. The model contains two members of #2, namely #3 and #4, each of which is a hiccuping event involving Harry. #3 has a temporal view as an interval #6, as do all events, but because #3 is an instantaneous event #6 has a single instant #0, which is after *now*, as its start and end point. #4 likewise has a temporal view #7 with a single instant #1 as its start and end point, where #1 is before *now*.

In some ways this analysis of the progressive aspect resembles the treatments in (Smith, 1991; ter Meulen, 1995). The key difference is that the sequential nature of the event reported in (28) emerges automatically from the interaction between the *single* meaning postulate for the aspect and the temporal properties of the event types, rather than being something which requires some subsequent revision mechanism of the kind described by (Moëns and Steedman, 1988). The 'habitual reading' of the simple aspect can also be obtained by providing a weak meaning postulate for the aspect and then examining the models that emerge if you combine this with the temporal properties of the event type, in a way that most other treatments simply cannot match.

3.4. Thematic roles

I have used 'thematic roles' throughout this paper to specify the relationships between an event and the individual participants in that event. Clearly these also need meaning postulates to spell out what they signify. It is, indeed, probably even more important to do this for thematic roles than for any of the other terms I have been considering. The surface markers which indicate such roles in English are very indirect – potential for subjecthood, prepositions which are employed when the item concerned is in neither subject nor first object position, things like that. As (Dowty, 1989) has shown, it is very dangerous to assume that there are straightforward correspondences which will enable you to determine the role that some entity plays in an event just by inspecting the surface form of a sentence.

There are two extreme positions which you can take on this issue. You can decide that each verb has a unique set of thematic roles associated with it, so that eating events involve an eater and an eater, buying events involve a buyer, a seller and a commodity, sleeping events involve a sleeper, and so on. Or you can decide that there is a fixed set of such roles, each corresponding to a single pattern of surface markers (so that the collection {subject of active verb, *by*-marked with passive, possessive determiner in nominalisation} would define one role, and {can fill first argument position with active, otherwise marked by *for*} would define

another). If you decide to work with the maximal set of roles defined by the first approach you will lose numerous generalizations which apply across a range of verbs; if you choose the minimal set defined by the second then you will have great difficulty distinguishing between cases. Does '*sleep*' take an agent, or a patient, or an actor? What's the relation between the uses of '*for*' in '*I bought a present for her*', '*I bought her a present for her birthday*', '*I bought some cream for her rash*'? What, if anything, have the objects of '*I wrote a letter*', '*I rode a horse*', '*I stole a bike*' got in common, and if they have nothing in common what is gained by saying that they are all playing the role of object?

Dowty suggests that there are various properties – animacy, degree of control over the event, extent to which the event alters the item in question, and so on – which can be used to determine which of the arguments of a verb will be the subject, which will be the object, and which will take up some syntactically more peripheral position. The more subject-like properties a constituent has, the more likely it is to be the subject, and if two items have similar sets of subject-like properties then the one with fewer object-like properties will win the race to be subject.

Different verbs will assign different collections of these properties to their arguments. We might have one verb with two arguments, one of which brought the event in question about, and another verb reporting a similar type of event with one argument which intentionally brought the event about: say '*kill*' and '*murder*'. It seems perfectly sensible to introduce terms for being involved in an event in these two ways, and then to back them up with appropriate meaning postulates, say:

$$\begin{aligned}\forall A \forall B (\theta(B, \text{actor}, A)) &\rightarrow \exists C (\theta(C, \text{actor}, A) \wedge \text{cause}(C, B)) \\ \forall A \forall B (\theta(B, \text{agent}, A)) &\rightarrow (\theta(B, \text{actor}, A) \wedge \text{want}(A, B))\end{aligned}$$

The first of these says that if *A* has the role of actor in the event *B* then *A* must have been involved in some other action *C* which brought *B* about. The second says that in addition to being involved in this way, *A* actively wanted *B* to happen.

It is clearly possible to continue in this way, looking for relationships between entities and events. Some relationships and configurations of relationships crop up frequently, so that it makes sense to provide names for them, and it *may* be possible to discover systematic relationships between particular configurations and surface markers. Others are specific to particular verbs. Consider

(30) *John drank a glass of wine.*

It seems reasonable to assign '*John*' the role of *agent* and '*a glass of wine*' the role of *object* here, and to allow the model to include those facts that follow from these assignments. But there are also other facts which will follow from (30) that cannot be obtained just from the generic properties of the roles. Before the event there is a glass with wine in it, afterwards the glass is empty and John's judgement will be slightly impaired. These clearly have to be dealt with by considering what drinking in general is like, and what wine is, and so on.

I therefore follow (Dowty, 1989)'s suggestion that a thematic role should be viewed as a bundle of properties associated with some way of participating in an event, with names being assigned to common bundles. A particular verb may then remark that the entity which has been assigned a particular role has a number of other properties. For (18), for instance, I drew upon the fact that the *agent* of an ordering event wants to have something of the kind specified by its *object*, and when I was discussing the two interpretations of the verb '*fire*' I drew upon the fact that the *object* of one interpretation must be a firearm whereas the *object* of the other must be an employee. The generic properties are things which are shared across a range of verbs, the idiosyncratic ones are local to specific cases.

This is a fairly anodyne view of the nature of thematic roles. It makes no contribution to the debate on how particular roles are realized in the surface syntax. It does, however, provide a concise way of specifying those facts about the participants in an event that are required if you want to do any substantial reasoning about the nature of that event.

4. Conclusions

My aim in this paper was to show that you can obtain fine-grained descriptions of the *consequences* of uttering a sentence by constructing a fairly sparse logical form and then using an inference engine to induce descriptions of the world which are compatible with this logical form and with any meaning postulates and general world knowledge. The models given in Figures 1–11 are all obtained in this way: construct the logical form, try to prove that this is incompatible with the meaning postulates, and when this fails read the model off the current open branch of the tableau.

In Section 2, I showed how this technique could be used to cope with dynamic semantics and underspecification by reasoning about the private knowledge of the speaker and the shared knowledge of both participants.

In Section 3, I showed that the same technique could also help when faced with the fact that the contribution made by a single lexical item can vary depending on the context. The analyses in this section depend heavily on the use of multiple views of an object. Dowty (1979) refers to '... van Fraassen's notion of *logical space*. There will be as many axes of logical space as there are kinds of measurement. [...] *Each axis might have a different mathematical structure according to the discriminations that can be appropriately made in each case*' (p. 126, my italics). There are clear parallels between this notion and the idea of multiple views, with the 'different mathematical structures' corresponding to the different characterizations of each such view. The fact that a single concept such as *envelope* or *path* can be fleshed out differently depending on the type of the object it is being applied to – what I referred to as the object-oriented character of such concepts – provides further flexibility, so that the significance of a preposition such as '*in*' or

'to' depends in rather delicate ways on the properties of the entities it links. This is not to say that such prepositions are ambiguous: 'in', for instance, always says that the location of some view of the figure is the envelope of some view of the ground, and 'from' always says that location of the start of some view of the figure is some view of the ground. The context sensitivity arises because the various views have to be of compatible types, and because the characterization of *envelope* and *from* depends on the type of the relevant entity.

The key observation is that acceptance of an utterance involves two steps:

- Find out what it means.
- Make sure that this is compatible with everything else you know.

In order to construct a computational realization of these two steps, I need a notion of 'what something means' and a mechanism for checking compatibility.

I assume that what a sentence means can be captured by producing a formal paraphrase: such a paraphrase is a *sentence* of property theory. It may include statements about who knows what. Cases where the surface form does not provide the hearer with enough information to determine what is being said are dealt with by allowing disjunctions over what might be in the speaker's private knowledge. Such paraphrases can be obtained by standard techniques: all the paraphrases above were produced on the basis of parsing the text on the basis of an HPSG-like grammar (closer to (Pollard and Sag, 1988) than to (Pollard and Sag, 1994)) and using techniques similar to those in (van Eijck and Alshawi, 1992) to glue the pieces together.

Checking compatibility is performed by a version of (Manthey and Bry, 1988)'s theorem prover extended to cope with property theory and equality. The expressive power of property theory means that it is possible to specify theories of knowledge and belief *within* the logic. The only properties of these theories that are exploited above are (i) anything that anyone knows is true, and (ii) anyone believes any proposition which is a member of their belief set.

Thus the fact that natural language semantics is *locally* dynamic – the *micro*structure of discourse – can be catered for by allowing interpretations to refer to the participants' shared knowledge. Natural language discourses also, however, have *macro*structure. This manifests itself in a variety of ways: indirect uses of language (Austin, 1962; Searle, 1969; Cohen and Perrault, 1979; Allen and Perrault, 1980; Cohen et al., 1990); attention shifting devices, as used in the pronoun dereferencing algorithms of (Grosz et al., 1983; Grosz and Sidner, 1986; Brennan et al., 1987); discourse structuring devices (Bilange, 1992); and so on. I believe, with (Bunt, 1994), that many of these will prove to be epiphenomena, and that careful study of the epistemic and doxastic attitudes explicitly encoded by lexical and syntactic choices will eliminate the need for much of this work. The current paper presents a fully (and efficiently) implemented grounding for the microstructure. The next task is to expand this to cover larger spans and more complex attitudes.

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